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MEMOIR

OF THE

NORTH & SOUTH ATLANTIC OCEAN,

CONTAINING SAILING DIRECTIONS FOR NAVIGATING
THE
COASTS OF FRANCE, SPAIN, AND PORTUGAL,
THE
WEST COAST OF AFRICA,
THE
AZORES, MADEIRA, CAPE VERDS,
AND ALL KNOWN
ISLANDS, ROCKS, SHOALS, AND DANGERS,
IN THIS NAVIGATION;
TOGETHER WITH
THE EAST COASTS OF NORTH AND SOUTH
AMERICA,
THE STRAIT OF MAGALHAEN,
THE FALKLAND & SHETLAND ISLANDS,
TIERRA DEL FUEGO, &c., &c.

GENERAL DESCRIPTION OF
WINDS, TIDES, AND CURRENTS.
TRACKS TO AND FROM ENGLAND TO THE CAPE OE GOOD HOPE,
COAST OF BRAZIL,
WEST INDIES, NORTH AMERICA, &c., &c.
AND A COPIOUS
TABLE OF LATITUDES AND LONGITUDES.

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SUPPLEMENT,

1847.

BREST. A notice was issued on the 18th of November, 1845, requiring that all vessels entering the bay, upon arriving at the Roads, to make direct for the guard ship, which is the outermost anchored ship, with jury masts, and carrying a blue and white burgee at the fore. They will be hailed from the guard-ship and told where to anchor; a yellow flag, furnished by the guard-ship, is to be hoisted and kept flying, until the ship is released from quarantine, by the doctor of the board of health, whose boat attends as soon as possible; libre pratique is then granted. This regulation is said to be common to all the Naval Ports of France. Page 2.

SAINTS LIGHT. On the northern part of the island of Saints, which is the largest of this group of islands, is a tower which exhibits a flashing light of the first order, at an elevation of 141 feet above the base of the tower, and 148 feet above the level of high water, at equinoctial spring tides. The flashes, which appear every four minutes, are preceded and followed by short eclipses, but which, however, are not total within the distance of 3 leagues. The weaker light continues about 3 minutes, and between the flashes is visible, in clear weather, from 18 to 20 miles. Lat. 48° 2′ 40″ N., Long. 4° 51′ 58″ W. Page 3.*

BEC DU RAZ LIGHT. A brilliant fixed light is shewn from a building erected on the highest part of this point, in lat. 48° 2′ 22″ N., long. 4° 43′ 52″ W. It is 46 feet above the base of the building, and 259 feet above the level of high water, at equinoctial spring tides. In clear weather this light can be seen 6 leagues off. Page 3.

NOTE. The Saints light is 5½ sea miles from the Bec du Raz light, on the bearing of N. 86° 50′ W. This bearing, which is likewise the general direction of the whole chain of rocks called the "Chauseé de Sein," passes about 4 cables' length to the S. of the N. W. extreme of the chain, which is 9 miles from the Sein light, and 14½ miles from that on the Bec du Raz. In approaching these rocks from the westward, the first light seen will be the flashing light on the Isle of Saints, and a single bearing of it will indicate to the mariner whether he is to the N. or S. of the line of direction of the two lights. In clear weather the Bec du Raz light will not be seen till the vessel is within 4 or 5 miles of the western extrême of the chain of rocks. When it is intended to pass to the southward of the rocks, a course should be steered so as to open the light on the Bec du Raz to the right, or southward of that on the Isle of Saints. But if it be intended to pass to the northward, or to enter the *Iroise*, no time should be lost in quickly opening the Bec du Raz light to the left, or northward of that on the Isle of Saints. Page 3.

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* This light bears a great resemblance to the Penfret light (on one of the Glenan Islands) but this resemblance cannot occasion any mistake, as the light of Penfret is within the horizon of the great light at Penmark, the flashes of which are at half minute intervals, and which, in fine weather, are seen as far as the Bec du Raz.

PENMARK POINT LIGHT revolves. It is exhibited from a tower, 134 feet above the sea, which renders it visible about 13 miles. The eclipses take place every half minute, but in ordinary weather they do not appear total within the distance of 3 leagues. Page 3.

ISLE OF GROUAIS LIGHT is exhibited from Pen-men, the N. W. point of the island. It is fixed and visible about 18 miles. A small fixed light, visible 9 miles, is also shewn from Fort de la Croix; but it is intended at some future period to replace the wooden building on which the light is shewn, by a small stone tower, which will exhibit a bright light, varied every 2 minutes by a red flash.

It is to be remarked that vessels coming from the southward will perceive the light on Belle Island (revolving every minute) before the light on Pen-men point can be seen; and in approaching the Isle of Grouais, the small light on the eastern point of the island will be seen at the same time as the new light on the N. W. point of the island. In like manner vessels coming from the westward will be exposed to no risk of mistaking the lights, for before the light on Pen-men Point will be visible, they will almost always have seen the great Penmark light, described above, and also the light on Penfret island, which flashes every four minutes. Page 4.

HEDIC. A small fixed light is shown about 300 feet from the eastern point of the island. It is 85 feet above the level of high water, and may be seen about 9 miles off. Page 5.

RIVER VILAINE. A small fixed light is shewn from the turret of a tower erected on Penau point, the north point of the entrance to the river. It is 52 feet above high water mark and visible 9 miles. Page 6.

ST. NAZAIRE. On the head of the new mole is a fixed light of the fourth order. It is 26 feet above the level of high water, and may be seen 8 miles off. Page 7.

LAVARDIN REEF. A white stone beacon, 33 feet above high water, has lately been erected on the reef, thus more perfectly denoting its situation. But the La Rochelle light is so placed, that the Lavardin and Chauveau rocks will be avoided by keeping the light open to the southward of the lantern tower, which stands 23 yards to the westward of it. Page 9.

RIVER GIRONDE. Inside the river have lately been placed the following lights:—A light vessel in four fathoms on the eastern edge of the Tallais Bank, which exhibits a fixed light, 33 feet above the surface of the water, and is so marked as not to lead into the channel which lies to the westward of the bank. It lies with the following marks and compass bearings. Point de Grave · fixed light, N. by W. $\frac{3}{4}$ W., distant 5047 fathoms; Talmont Steeple E. $\frac{1}{2}$ N. 3527 fathoms, and the red harbour light at Richard, S. $\frac{1}{2}$ E. 4484 fathoms. A bell is rung during foggy weather. Richard, red harbour light, is fixed and visible 8 miles. Tour de Terre Negre, a fixed light, 118 feet above the sea, visible 10 miles.* Royan. A small harbour light visible 6 miles. Pauillac. A fixed harbour light at the landing place, visible 2 leagues; and Blaye harbour light visible 4 miles. Page 10.

BASSIN d'ARCACHON. On Cape Ferret, northern side of the Bassin, 3281 yards from the entrance, is a lighthouse, which exhibits a fixed light, 167 feet above the sea, visible about 18 miles. Lat. 44° 38′ 43″, N., long. 1° 14′ 53″, W. Page 11.

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* This light is intended to facilitate the navigation of the north passage, and to avoid the English Bar. It is not visible south of a line passing through the Tour de Terre Negre and that of St. Palais, bearing from each other N. W. by W. and S. E. by E. nearly.

BIARITZ, On Point St. Martin de Biaritz, at the distance of 2½ miles, S. 33° W. from the mouth of the Adour, is a lighthouse, from which a revolving light is exhibited. The flashes succeed each other every half minute, and in clear weather, can be seen by an observer, whose eye is 33 feet above the sea, about 8 leagues. The eclipses are not total within the distance of 4 leagues. Lat. 43° 29′ 38″, N., long. 1° 33′ 6″ W. Page 15.

SOCOA. The lighthouse on the point exhibits a fixed light, visible 21 miles. Page 15.

ST. SEBASTIAN. A fixed light is shown from a tower erected on Mount Orgullo. It is 205 feet above the level of the sea, and visible from 15 to 16 miles. The light is only exhibited during the winter months, from September 14th to May 3rd. A light, exhibited on Mount Igueldo, has now been discontinued. Page 19.

SANTANDER. A lighthouse has lately been erected on Cape Mayor, the western point of the harbour. The lights shown from it are 330 feet above the sea; the upper and lower parts fixed, the intermediate revolving once in a minute. In clear weather the flashes may be seen 7 leagues, but by one elevated 40 feet above the sea, they can be seen 9 leagues. With the Vientor de Travesia, or wind upon the beam, caution is required not to mistake the distance on approaching the coast. Page 24.

RIVADEO. The hermitage on Mt. St. Marks is said to no longer exist. Page 26.

OPORTO. For fixed light read revolving light, eclipsed every 6 minutes. Page 37.

ROCK OF LISBON. The light on this Cape has lately been altered from a fixed to a revolving light, each revolution being completed in two minutes. During the first minute it presents a red light, the greatest intensity of which, continues 30 seconds, and during the second minute it presents a bright light, the greatest intensity of which also continues 30 seconds.

The light is in lat. 38° 46′ 5″ N., long. 9° 29′ W., and being 498 feet above the level of the sea, can be seen 8 or 9 leagues distant. Page 41.

CAPE CARVOEIRO. The revolving light on this point has lately been converted to a fixed light, for the purpose of creating a greater distinction from the Berlings light. Page 40.

CAPE ST. VINCENT. From this cape is now shown a revolving light, visible 19 miles. Each revolution of the light is performed in two minutes, in the course of which period, a brilliant light appears for a short time, and is then succeeded by darkness. The lighthouse appearing like a church steeple, stands on the western part of the cape, in lat. 37° 2′ 9″ N. long. 9° 0′ 0′ W., and shows the light at an elevation of 221 feet above the sea. Page 44.

VILLA NUEVA. Instructions for entering—Signals made at the Fort of Ferragueda on the east side of bay:

1.—A red flag with a broad pendant under the same, indicates that ships are to choose a proper place where to take a pilot on board.

2.—A broad pendant with a red flag under the same, signifies that no pilot can be sent on board.

3.—The Portuguese flag with a red one under the same, is a signal that ships must immediately return to sea again.

4.—A red flag by itself signifies that a ship may approach the bay to take a pilot on board.

5.—If it should happen that on account of stormy weather he could not venture to leave the bay, and ships are forced to enter the same without one, signals will be made with the red flag from the fort,—1845. Page 44.

GIBRALTAR. From Point Europa, eastern side of the bay is now shown a fixed light. Page 54.

AZORES.

ST. MICHAEL'S. Five buoys are now laid down in this anchorage, which considerably reduce the risk of vessels leaving their anchors and chains behind them when they leave the road.

The following signals to ships have lately been established here, and are made at the flag staff on Custom House Quay, Ponta Delgada:

1.—*A red flag:*—Vessels at anchor should immediately weigh on account of the weather.

2.—*A white flag:*—Vessels in sight may safely make for the anchorage.

3.—*A red flag with a white border:*—Vessels must not send their boats on shore, landing being dangerous. Page 60.

BERMUDAS OR SOMERS' ISLANDS.

On the 1st of May, 1846, a revolving light was established on the southern part of this island, in latitude 32° 14′ N., long 64° 51′ W. Every minute it brightens up into a strong glare, which continues for 6 or 8 seconds; and as it is 365 feet above the level of the sea, it can be seen 7 or 8 leagues. The light can be seen on all bearings of the compass, except those between N. 64° E. and N. 74° E., where it is intercepted by high land. Within the distance of 7 miles a faint but permanent light can be seen between the brilliant flashes.

Remarks:—At night or in thick weather it is advisable not to make Bermuda to the north of 32° 8′ N. until the light or land can be seen. In coming from the eastward, the light should not be brought to the southward of W. by S., nor approached at night nearer than 6 or 7 miles. While coming from the westward the light should not be approached nearer than 12 miles, unless first brought to bear to the northward of N. E. by E. A vessel making the light to the southward should haul off immediately, as reefs extend from it to a distance of 16 miles to the northward.

To this may be added the following remarks made by Captain Barnett, R. N., August, 1846.

Bermuda Light House stands in lat. 32° 15′ 04″ N. long 64° 51′ 36″ W. Horizon intercepted between N. 43° 24′ E. and N. 47° 34′ E. by one hill, and between N. 49° 07′ E. and N. 57° 35′ E. by another hill; these being the true bearings, and the variations of the compass being 27° 00′ W. The light may be seen from an elevation of 10 feet, 23, 6 miles; 20 feet, 25 miles; 40 feet, 27 miles; 80 feet, 29, 8 miles; 100 feet, 30, 9 miles, supposing no refraction in the atmosphere at the time.

Variation of the needle, 27° 01′ W.; dip of the needle, 62° 26′ 15″ N. Commander Barnett, October, 1845. Page 85.

ROCKS, SHOALS, &c., IN THE NORTH ATLANTIC.

FORMIGAS OR ANTS' ROCKS. Captain Vidal who has lately been employed surveying the Azores, reports that the position of the Formigas is incorrect as laid down in the Charts from Tofino's survey. The following is his report to the Hydrographer to the Admiralty.

"It is with regret and vexation I have to state that I find Tofino considerably in error in that celebrated hydrographer's work relative to this locality.

"Tofino, in his Sailing Directions, states, that these rocks were landed on, in order to observe various points of the island of St. Mary, and that from the centre of the larger island Point Castelo on St. Mary's bears S. 24° 30′ W., and the Pico Alto on the same island, S. 34° 30′ W., and having observed on its parrallel and very close to it the latitude may be confidently stated at 37° 17′ 10″ N.

"The angles, as observed by Captain Vidal, were Point Castelo S. 29° 05′ W., and Pico Alto S. 40° 38′ W.; but yet being unwilling to think Tofino in error, he landed again the next afternoon, and the result of that day's observations were Point Castelo S. 29° 2′ W., and Pico Alto S. 40° 36′ W. Tofino and his people must therefore be in error, differing from Captain Vidal in his bearings of Point Castelo 4° 35′ more easterly, and Pico Alta 6° 08′ more easterly. This difference in bearing is on a distance of 23 miles." *Nautical Magazine*, 1844. Pages 47 and 89.

DOLLABARATS' SHOAL is a shoal lying to the S. E. of the Formigas, seen by P. Dollabarats, commander of a French vessel belonging to Bayonne, while on his return voyage from Martinique, in 1788, but hitherto considered doubtful, principally from want of sufficient evidence as to its existence.

The following lately appeared in the Shipping Gazette, respecting the Dollabarats' Shoal.—"Lisbon, Dec. 6th, 1843. A notice has been issued by the Minister of Marine, to the effect that a shoal, with 11½ feet water on it, has been discovered about 4 miles to the S. Eastward of the "Formigas" or Great Formiga Rock, in the vicinity of the Azore Islands. The position of it observed by Captain Vinal is lat. 37° 13′ 30″ N., and it bears from the Formigas, S. 44° E. (true) distant 3½ miles." It is a fearful danger, the least water found on it was eleven feet at low water. It is also a most insidious danger, only shewing itself when there is a high swell or sea." Pages 47 and 89.

PRONK ROCKS. The following has been communicated to the Nautical Magazine, by Captain Fokhens, of the Dutch ship Rhoon and Pendrecht.

"Captain a Pronk, of the Dutch barque De Hoop, reports that on his passage from Batavia to Rotterdam, in the North Atlantic Ocean, near the Azores, April 6th, 1844, in the afternoon, sailing with a strong breeze and fine weather, being on the quarter deck with his officers, they were much alarmed by some of his people in the foretop, calling out that they saw a large rock close by on the lee-bow. The captain immediately ordered the helm to be put down, and the vessel luffed up three or four points, to avoid the danger; with astonishment they saw several rocks plainly visible from deck to every man on board. They passed them within a cables' length, and Captain Pronk says, that it was an extensive group of rocks, with several points above water, some of them more than sixteen feet in height, against which the sea broke furiously. The captain places this danger in lat. 38° 32′ N. and long. 33° 16′ W., by very good observations and chronometer; the next day they saw the Western Islands, and found the longitude by chronometer very exact." Page 89.

This may possibly owe its existence to recent volcanic action; that it has existence we have no doubt, as dangers have before been reported in this neighbourhood. See note 19. Page 98.

TULLOCH REEF. This reef has probably submerged, as Captain Wilkes, who was sent out by the United States' Government, in 1838, to explore hidden dangers in the Atlantic, searched for it without success. He says, "On the night of the 13th September, we laid by, just after passing the north end of St. Michael's, in order to examine the position of the Tulloch Reef by daylight. We passed within a mile and a half of its reported position, but saw nothing of it, although the sea was running sufficiently high to have made a heavy break on it, if it did exist." Captain Vidal also sought in vain for it. Pages 89 and 99.

JOSYNE ROCKS. The Penningham, Captain Purchase, from Laguna, at Liverpool, reports on the 19th February, on the passage out to Vera Cruz, at 11h. 30m. a. m., having passed within 20 feet of a rock which was supposed to be the Josyne Rock, but not in the same latitude and longitude as laid down in the chart, but by his latitude by observation, 30° 13′ N., longitude by chronometer 28° 18′ W. The rock was shaped like a sugar loaf. *Shipping Gazette, Aug. 20th*, 1846. Page 89.

SHOAL ON THE BANKS OF NEWFOUNDLAND. A shoal with only 21 feet water upon it was discovered by Jesse Ryder, Master of the fishing schooner Bethel, (belonging to Province Town, Massachusets,) on the Grand Bank of Newfoundland, in lat. 46° 30′ N., having observed on the shoal, and observed it distinctly, it being a rock of about 100 or 200 feet surface, supposes it to be about 50 miles east of the Virgin Rocks. Shoal bears from Nine-fathom Bank, S. by W. by compass about 1½ miles, discovered it accidentally while searching for the Nine-fathom Bank, to fish on. Am certain it was not any part of the Virgins, for I afterwards saw them, and from my experience of the different fishing grounds, know this shoal to exist.

This information I obtained from Mr. Ryder himself, and took a sketch from one that he had in the American Consul's Office at this place. *Walter Douglas*, Commander of the Unicorn Steam Packet, Halifax, Feb. 1845. *Nautical Magazine*, 1845, Page 267. Page 88.

ORION ROCK. "We have received the following communication from Liverpool. The master of the Orion, belonging to our port, Luytjas, from Trinidad de Cuba, arrived in the Weser, has furnished the following particulars of a rock fallen in with;—On my voyage from Trinidad de Cuba for Bremen, we perceived, May 5th, lat. 34° 51′ N. long. 72° 28′ W. a rock about two feet above water. It had the appearance of a water cask of two or three hogsheads. We were at a distance of only twenty feet from the rock, when we fortunately in time discovered it. On none of my sea charts (and I had several of the most recent on board,) was this rock to be found. *Bremen*, July 17th, 1845." *Nautical Magazine*, 1845. Page 89.

DYET ROCKS. "On my passage from St. Kitt's to London, and when off Bermuda, May 17th, 8h. a. m., we passed within 30 or 40 feet of two sunken rocks, having 6 or 8 feet over them, it being very smooth at the time, in lat. 32° 46′ N., at noon, long. 59° W., by a good chronometer, and by several lunar observations previously. I strongly suspect they are the rocks marked as doubtful in lat. 32° 30′ N., long. 59° W." *Robert Dyet*, Master of the Barque Catherine Greeme. *Nautical Magazine*, August, 1845. Page 89.

HILTON ROCKS. The following was communicated to the Nautical Magazine, 1845, by Mr. Livingston, of Liverpool.

"Barque Secret, from Valparaiso to Liverpool, 12th May, 1845. While observing a meridian altitude, breakers were reported; they were of no great extent, but Mr. H. plainly saw some objects in the hollows of the waves, which he felt certain were heads of rocks. The swell was very heavy, and he thinks in smooth water they would be nearly in a level with the surface of the sea. The breakers were about 1½ or 2 miles S. W. (by compass) from the vessel, and at the time she was running 7½ or 8 knots, with steering sails set, so there was not much time for very particular remarks.

"The latitude stated 39° 18′ N., and longitude 35° 50′ W., was from meridian observations, and the longitude from the mean of these observations, viz.: their own chronometers, the chronometer of a ship in company, and a lunar taken by Mr. H. himself, the same afternoon." Page 89.

CÆSAR'S BREAKERS. The following confirmation of their existence appeared in the Nautical Magazine, 1846. Page 613.

" On the night of the 4th of July last, at 7 p. m., fresh breeze, ship running 6 knots, saw breakers on the larboard bow, distance a quarter of a mile, strong current setting towards them, wore ship and stood along them; when first seen, they bore by compass, N. W. by N., and seemed to be a long ledge of rocks in a crescent shape; at 3 a. m. the following morning, saw the south east end of the reef on the starboard bow; a strong breeze coming on prevented us making any further examination; the man, in heaving the lead, struck it upon a hard rock, but had no bottom the second cast.

"There can be no doubt as to the existence of this reef, and so convinced were the crew, that they stood ready to clear the long boat, neither was it any optical delusion from effect of current or phosphorescence of the sea.

" As they are in the longitudo of vessels crossing the equator, it is surprising they have not been reported; by good sights at noon, with chronometer and computation of distance run, their position when seen, was lat. 3° 07′ N., long. 24° 14′ W. *Charles Price*, Supercargo. Page 90.

COAST OF AFRICA.

CAPE MESURADO. From this point is now shown a fixed light. Page 136.

CAPE PALMAS. From this cape is now shown a fixed light 74 feet high. Page 138.

S. W. COAST OF AFRICA. Commander Matson's, R. N., account. *Nautical Magazine*, 1844. Page 129.

"ELEPHANT BAY is one of the best anchorages on this part of the coast; it is perfectly secure and sheltered from the only winds that blow, the south and south-west. It may be known at a great distanco by a very high piece of table-land near the bottom of the bay, and under which is the best anchoring ground; that near the eastern shore is rocky in some places. The rollers, or *calema*, which occasionally set in along tho whole coast, are not felt in this bay. Fish can hero be procured by the seine in great abundance, and the hills abound in game and wild animals of all descriptions, which, owing to there not being any inhabitants, are remarkably tame. This is by far the best place on the coast for refitting and refreshing the ship's company after a cruise. I have repeatedly anchored here for a few hours, merely for the sake of giving the men a run on shore, to wash their clothes, to bathe, and haul the seine. It is the only place where this can be done with impunity; the climate is very salubrious, as is the whole coast to the southward of Salinas. Before anchoring in this bay to refit, it would be as well to procure a bullock or two, and some vegetables, at Little Fish Bay (lat. 15° 13′ S.) which can be purchased there on very reasonable terms. Water cannot be procured in Elephant Bay, excepting during a rainy season, which sometimes does not occur once in five years; there was not any rain whatever during the years 1840, 1841, 1842; but I have been informed that when the rains do set in, they continue incessantly for weeks together, and the country then becomes almost inundated. The appearance of a number of large water courses, seems to corroborate this statement. Excellent oysters can be gathered from the rocks on either side of the bay. Page 173.

"THE FRIAR'S ROCKS are in lat. 13° 14′ S., and long 12° 44′ E., and are about 12 or 14 feet high.

"LUASH. In lat. 13° S. and long. 12° 57′ E. is a very snug harbour for small vessels, completely sheltered from all winds. It is here that the slave vessels belonging to Benguela generally embark their slaves. Page 173.

"SALINAS POINT is a piece of low flat sandy land, extending 5 or 6 miles beyond the high land, and has a remarkable tree at its extreme point. There is a reef to the southward of it, and the water between it and Luash is shoal; but to the northward of the point the shore is very bold, there being 10 fathoms within a cable's length of the beach. It is however dangerous to approach it during the night, for the beach being of white sand, and projecting so far from the high land behind it, renders it difficult to be seen until very close. Many vessels have run on this beach in a fine clear night.

"The coast between Salinas and St Philip's Bonnet does not appear to have been surveyed by Captain Owen, or so imperfectly as to mislead strangers. The Sailing Directory gives the course from Salinas to St. Philip's Bonnet, as E. N. E. ¼ E., but it is not possible to make a direct course between these two points; the land between them forming the segment of a circle. A stranger having made the high land of St. Philip's Bonnet before dark, bearing E. ½ S. or E. ¾ S., 5 or 6 leagues, would not see the intervening low land, and would perhaps (guided by the Charts and Sailing Directory) steer directly for the Bonnet; or he would consider east to be a safe course, but even this would take his vessel on the beach, (off which there is no anchorage).

"When St. Philip's Bonnet bears E. S. E. you may steer directly for it, and having passed it at any convenient distance, proceed into Benguela Roads. A little to the westward of the Bonnet are several snug little coves, where boats or small craft can lie unseen. In one of these a boat belonging to the *Waterwitch* remained concealed for 9 days, watching a slaver in Benguela Roads, which she captured on her leaving the anchorage, with 390 slaves on board.

"BAHIA TORTA is a fine spacious bay, having good and secure anchorage; but I had not an opportunity of making a survey.

"ST. PHILIP DE BENGUELA is in a wretched state of dilapidation and decay; the houses, originally of mud, are now falling to pieces. There is scarcely any trade but that in slaves, and even that has been almost entirely suppressed by British cruisers. The soil is perfectly barren, not the slightest appearance of vegetation, excepting near the river Catumbela.

On leaving this anchorage, a vessel should not bring the town to bear to the westward of south until she is four or five miles distant, she will then be clear of the shoal to the northward. Page 172.

"Anha is a small river 9 miles E. by N. ¾ N.; from Lobito Point it runs into a small bay, which may be known by trees close to the shore. You may anchor in 7 fathoms with the river S. E. by S. two miles.

"Logito River. In lat. 11° 58′ 30″ S. and long. 13° 45′ 15″ E., is 25 miles N. E. by E. from Lobito Point. It is an excellent watering place when the sea is smooth, the water coming from the mountains, is perfectly wholesome and better than at any other place on the coast. The most expeditious plan is to haul the casks off to a boat anchored outside the surf, and then raft them off to the ship, which cannot approach nearer than 1¼ miles to the shore. Logito may be known by the high bluff point which forms the south point of the bay.

"From Logito the coast runs N. N. E. ¼ E. 39 miles to Quicombo Bay. The shore is very bold, being formed of high perpendicular chalk cliffs, which are seen at a great distance, when the sun shines to the westward of the meridian. I have run up the coast from Lobito to Quicombo within a mile of the shore, without having soundings with the hand line.

"Whales' Head. In lat. 11° 35′ S. is a dark coloured point projecting about a mile into the sea from the land on either side; about two miles to the northward is a remarkable piece of table-land near the beach.

"Quicinga. In lat. 11° 29′ S. is a cluster of native huts; you can seldom land here except in surf boats.

"Quicombo. The south point of this bay is in lat. 11° 20′ S., long. 13° 48′ E., off which is a rocky shoal, on which the sea sometimes breaks, and which extends about a mile to seaward. There is good anchorage in the bay, excepting during the time of the rollers or *calema*, and then it is requisite to anchor outside the point. To enter the bay you should keep the village bearing S. or S. by W., when you may anchor at any convenient distance. The inner anchorage is with the village bearing S. by W., the south point S. W. by W., and the north bluff point N. E. by N., or with the fort at Novo Redondo just shut in by the latter. On leaving the bay you should not come any higher than north-west until you are well clear of the shoal off the south point. The bay may be known at a distance by a white road leading from the village over the mountains. It is 8 miles S. W. by S. from Novo Redondo.

"Novo Redondo. The fort is in lat. 11° 12′ S., long. 13° 50′ 30″ E. I found it to be 1h. 18m. 23secs. east of St. Helena time office, and 0h. 2m. 2secs. east of Banguela Fort, by careful and repeated chronometric admeasurements. The town is considered to be the third in point of size and consequence in the Portuguese possessions, but the fort appears to be in a very dilapidated state. Stock of all kinds may be procured here, but no water. You can seldom land excepting in the surf boats, a number of which are always in readiness on the beach, though not always at the service of British Officers. The best anchorage is with the fort bearing E. S. E. in from 4 to 7 fathoms. The town may be known by the large white houses on the hill, or at a greater distance by the very high mountains behind it. Page 172.

"Old Benguela Head. In lat. 10° 47′ 30″ S. and long. 13° 41′ E., is about 27 miles north of Novo Redondo; it is a high bold promontory, steep at its extremity. Between this and Novo Redondo the coast has not been very accurately surveyed, but sufficiently so for common purposes; you may boldly approach any part of it, as the water deepens when to the northward of Novo Redondo. In lat. 11° 1′ S., there is a small bay in which slave vessels sometimes anchor to embark their slaves, or to wait for instructions. Page 172.

"CAPE ST. BRAS is N. $\frac{1}{4}$ W. 52 miles from Old Benguela Head; the coast between is formed of moderately high chalky cliffs, the soundings are regular, with 10 fathoms two or three miles off shore.

"RIO LONGO. The entrance is in lat. 10° 19′ 30″ S. long. 13° 31′ E. This has been a general rendezvous for slave vessels from Benguela and Saint Paul de Loando, from which places, the slaves are marched overland. There are not any inhabitants; but wild animals are seen in great numbers.

"RIVER COANZO. Only small vessels are enabled to cross the bar of this river, and those only at high water, and when the sea is smooth. When there is any swell the sea breaks wholly across the entrance.

"ST. PAUL DE LOANDO. I found the meridian distance between the north-end of Loando Island and the time office at St. Helena to be 1h. 15m. 39secs., and between the former place and Benguela fort 0h. 0m. 42secs. The trees on the Loando island, just open to the westward of fort San Miguel, lead you clear of the outside edge of the shoal; you may also anchor on this bearing close to Loando island, but it is indifferent holding ground. Good oranges may be procured here cheap. Page 171.

"AMBRIZ. The best anchorange in the bay is with the bluff cliff, or south point, bearing S. E. by S. in 6 or 7 fathoms. Ambriz may be known by a thick green wood, close to the water, about a mile to the northward of the town; or at a greater distance by a high piece of saddle land immediately behind it. Page 171.

"RIVER CONGO. When the sea breeze is not sufficiently strong to enable you to stem the current, you may steal round Shark's point, by keeping as close as possible to the point (within 20 yards). At half flood the current slackens, and an eddy sometimes runs up close to the shore.

"In the stream of the Congo, unless with a commanding breeze, a vessel becomes quite unmanageable, owing to the strength of the superficial or upper current, and will not answer her helm unless going 5 or 6 knots. If, when endeavouring to enter the Congo, you are driven over to the Mona Mazea Bank, anchor instantly you gain soundings or you may be driven on shore. On the left bank of the river, about 5 or 6 miles below Scotchman's Head is a shoal not laid down in Captain Owen's chart, every man-of-war that has attempted to enter thus far has struck on it. The lead gives you no warning as the water suddenly shoals from 7 to 2 fathoms. Page 170.

"KABENDA OR CABENDA is the most notorious slave-trading place on this part of the coast; all slaves collected in the river Congo and neighbourhood are sent here for exportation. There is a dangerous shoal about 4½ miles N. by E. $\frac{1}{2}$ E. from the town of Porto Rico, on which the sea sometimes breaks; it is not noticed in the Admiralty charts or books of directions. There is also another shoal to the southward and westward of Kabenda point. In approaching Kabenda from the northward you should not haul in for the bay until Porto Rico (a conspicuous town on the hill) bears to the eastward of the south, and when approaching from the southward not until Kabenda point bears south-east. These two bearings will lead you clear of the shoals, and you may thus approach Kabenda point, and anchor at any convenient distance. If desirous of entering the bay, or inner anchorage, you should bring Kabenda point to bear S. S. E. or S. E. by S., then steer directly for it until you shoal your water to three fathoms; you will then be on the south side of the entrance, which is very narrow; you may then steer along the south shore into the bay, giving Kabenda point a berth of three quarters of a mile. The best berth in the inner anchorage is with the western Factory S. W., Porto Rico S. by W., and the extreme point W. ¾ N., in 3⅓ fathoms; there is also good anchorage in the entrance of the channel, in 4½ fathoms, with Porto Rico bearing S. by E. and Red Point S. W. ½ W. In the offing you may anchor at any distance, and in 35 fathoms, out of sight of land.

"To cross the stream of the river Congo from the northward, it is requisite either to go 200 miles off shore, or to keep in anchoring ground;—I always choose the latter. If you are not certain of getting across the stream before the sea breeze dies away, anchor on the Mona Mazea bank in 6 or 7 fathoms, until the following day, when a two hours' sea breeze will take you to the southward of Sharks' point, and you are then out of the influence of the stream, which always runs to the N. N. W.

"LOANGO BAY. Is known by a remarkable wood to the southward, or by the red cliffs to the northward; great care is requisite in approaching this bay from the southward, as there is a shoal off the south-west point with only two fathoms. To enter the bay you should bring the factory houses to bear south-east; then run in until you shoal your water, which you do almost imperceptibly, and anchor at any convenient distance. The fresh water here is very good, as it filters through the rocky mountains. The most convenient anchorage for watering is with the south point bearing S. W. by W. ¼ W., and a clump of trees on the hill, S. E. by E. ¼ E., in 3 fathoms water. But I would not recommend a vessel to come quite so close, without having previously sounded the bay. Stock of all kinds can be procured here, on reasonable terms." Page 169.

METEOROLOGICAL OBSERVATIONS BY COMMANDER MATSON, R. N.*

"SEASONS. On the west coast of Africa, south of the equator, the rains begin generally early in November, and continue until the middle of April. They are earlier on the coast of Angola and Benguela, and later to the northward of the Congo. To the southward of 10° S. there is occasionally not any rain whatever for several years; but sometimes in the months of November and December, it falls in excessive quantities, and the country then becomes in parts almost inundated. There was not any rain near Benguela, during the years 1840, 41, and 42; but the appearance of immence water courses, in which were large trees that must have been carried by the torrents many miles from the interior, amply corroborate this statement.

"About Kabenda and Malemba the rains are very heavy, from the beginning of December until the middle of January. To the southward of 10° S. the months of January and February are very fine, but oppressively hot and sultry.

"The month of March and April are the most unhealthy. This is owing to the exhalations from the earth after the heavy rains, which the light sea breezes are not sufficient to dispel.

"From May to September are the most pleasant and healthy months; the sky at this time is generally overcast or cloudy; in the Months of June, July, and August, a thick fog (called the "smokes") prevails; it is not caused by exhalations, and is neither unwholesome nor unpleasant. Tornadoes occur in September and October; they generally blow from south-east, and are not nearly so violent as those to the northward of the equator, nor are they usually accompanied with heavy rain."

"WINDS. From Cape Voltas to Cape Negro the wind blows constantly from south a double-reefed topsail breeze. From Cape Negro to Salinas it continues to blow up the coast from S. S. W.; it becomes more moderate as you get to the northward; and when to the northward of Cape Mary frequently blows from S. W. and W. S. W.

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* Nautical Magazine, 1844, page 89.

"Between Salinas and the river Congo the prevailing winds are south-west during the year. The sea breeze generally sets in about 1 p. m. from W. S. W., it generally veers to the southward, and continues to blow from S. S. W. or south during the greater part of the night, and becomes very light or calm before daylight. When within 10 or 15 miles of the shore, the land breeze will reach you, and continue sometimes from sunrise until 8h. or 9h. a. m.; but if 30 or 40 miles off shore you will generally have a calm from sunrise until noon. The sea breeze occasionally sets in from W. N. W. and N. W., and this happens more frequently in the months of October, November, and December. During the "smokes" (in June, July, and August) the winds are very light, and blow from S. and S. S. E. during the whole twenty-four hours.

"At the distance of 80 or 100 miles off shore the south-west winds become more regular, they gradually veer round to the southward and eastward, and imperceptibly unite with the south-east trade. A line drawn from the Tropic of Capricorn, in long. 5° E. to the meridian of Greenwich, in lat. 5° S., may be considered as the eastern limit of the south-east trade.

"From the river Congo to Cape Lopez the land and sea breezes are not so regular. From October to April the winds here are almost constantly from S. S. W. and S. W.; and heavy squalls from S. W. and W. occur in December and January. From May to September the land and sea breezes are more regular, the latter at this time often set in from W. N. W., and blow during the night from S. W. and S. S. W., and then the land breeze is only felt close to the shore.

"CURRENTS. A current is almost constantly running up the coast of Africa from the Cape of Good Hope to the River Congo, at the average rate of 1 mile an hour. It is here met by the impetuous stream of that river, which runs with undeviating regularity to the N. W. and N. N. W.' at the rate of from 2 to 4 miles in the hour, until it unites with the equitorial current, two or three degrees south of the equator. The stream of the Congo is felt at the distance of 300 miles from its entrance, and may be known by the clayey appearance of its waters, which are of a yellowish olive green colour. From May to October the current occasionally runs to the southward *close to the shore*, and continues to do so for 48 hours.

"ROLLERS or CALEMA. A day or two after the new moon, in the months from May to September, a very heavy swell sometimes sets in along the whole coast from 3° to 15° S.; this occurs more frequently during the "smokes." It renders the open bays very dangerous to remain at anchor in, where the water is very shallow. At this time it is nearly a calm, never more than a very light breeze; you can easily warp outside of the heavier rollers by a small hawser; or you may ride by a kedge anchor and hawser; when the chain-cable would snap with jerks, caused by the sudden influx of a large body of water into the bay. During the period of the caléma you cannot land on the coast, except in the surf boats."

REMARKS on the coast from the Cape to Ichaboe by CAPTAIN MORRELL. *

"*September* 13*th*. We continued exploring the coast, keeping the boats close in shore in search of fur-seal on every mile of the coast, until

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* Narrative of four voyages by Captain Benjamin Morrell. New York, 1832.

Saturday, the 13th of September, when we fell in with a small island, in lat. 31° 32′ S., long. 17° 56′ E., about half-a-mile from the shore. Here, for the first time, our search was successful. A small reef runs off from the west end of this island, to the distance of about a hundred fathoms.

"From this island we followed the shore to the north-westward, passing Point Grazing, in lat. 31° 20′ S., and four places, *which are said to be rivers*, viz., Zwarte Darn River, in lat. 30° 45′ S., not open; Greene River, in lat. 30° 33′ S. not open; Zwarte Lintjie River, 30° 21′ S., not open; and Koussie River, in lat. 29° 45′ S., long. 16° 57′ E.; the latter was open, and may be passed in boats only at full sea. It is closed, however, at times during the dry season, by the shifting of the sand-hills in windy weather. This may be called Salt River, as the salt water runs up it about 15 miles, 10 miles of which is very shallow. This is the northern boundary of the Cape colony.

"Many of the rivers which intersect this extensive colony are merely periodical torrents, which continue to flow during the rainy season, but which during the summer, leave their deep sunk beds almost completely dry; and the rivulets, which are supplied by the mountain springs, have scarcely escaped from their lofty sources before they are either absorbed by the thirsty earth, or evaporated by the heated air. Even the permanent rivers, some of which contain sufficient water for the navigation of small craft, for several miles up the country, are all, except the Knysna, rendered inaccessible by a bar of sand or a reef of rocks across the mouth.

"From the mouth of the Koussie river the coast trends N. N. W., a little westerly, 28 leagues, to Cape Voltas, in lat. 28° 24′ S., long. 16° 28′ E., variation per 'azimuth 25° 55′ W. There is a bank of soundings that puts off to the west of this cape, about 30 miles, at which distance there are 40 fathoms of water, the depth becoming gradually and regularly reduced as we approach the shore. This bank extends southerly along the coast, quite to the Cape of Good Hope, varying from 30 to 50 miles off shore; and from Point St. Martin's to the last-named cape there are many dangers lying from 2 to 5 miles off shore. But north of St. Martin's to Cape Voltas there are no dangers more than a quarter of a mile from the land. Page 175.

"The Socos Islands, laid down on the charts as lying in lat. 29° 35′ S., long. 16° 34′ E., said to be about 20 miles from the land, are not to be found. They have been represented as four in number, with several small islands between them and the continent. But I can assert possitively that no such islands exist, neither is there an island of any description lying between St. Helena Bay and Cape Voltas more than half a mile from the main.

"Cape Voltas is also very erroneously laid down in lat. 29° 20′ S., long. 16° 31′ E., with a deep bay running in on the north side of the cape, 25 miles, in an E. S. E. direction, with deep water all over the bay. Now the true and correct situation of Cape Voltas is in lat. 28° 27′ 30″ S., long. 16° 17′ E. The Cape is a high bluff point projecting into the sea, and there are several rocks lying about half a mile to the west of it, beyond which there are no dangers. About one mile north of the cape there is a small bay, not more than two miles in length, and 1½ mile in breadth, within which the anchorage is not safe, as the ground is foul, and heavy rollers are continually heaving in from the westward, at all seasons of the year. Ships, however, which are in want of firewood, may lie off and on, and obtain any quantity from the head of the bay. The land around the cape, and to the south as far as Koussie river, is high on the seaboard, running back into elevated mountains. The hill sides are covered with very good grass for feeding cattle, but the summits of these eminences are one mass of volcanic productions.

"It is said there is no fresh water to be had on this coast, north of Cape Voltas. But this is an error, as any quantity can be had in Voltas Bay, in the rainy season, without the trouble of searching for it under ground. But by digging fresh water may be had at all seasons of the year, at a short distance at the head of the bay, where the landing is very safe and conveniently sheltered by two small islands lying close to the beach, inside of which the water is perfectly smooth. This is also a fine place to procure bullocks' hides, fox skins, leopard skins, ostrich feathers, and many other valuable articles.

"*September* 18*th.* After taking on board a sufficient quantity of wood in four hours, we left Cape Voltas, and steered to the north, with a fine breeze from the south, and fair weather. At 3 p. m. we reached the entrance of Gariep or Orange River, between which and Voltas Bay, on the sea coast, the land is very low, sandy, barren, and desolate. It retains this appearance for some distance from shore; but after running back 6 or 8 miles, it begins to swell into hills, and still further back it rises into lofty mountains, which stand on each side of the river, on the banks of which are a few Hottentot villages. The wealth of the inhabitants consists of herds of cattle and sheep.

"ORANGE RIVER, though extensive in its course, is in the latter part of the dry season, nearly closed at its entrance, and the water continues shallow 4 or 5 miles westward of the river's mouth. On this shoal the sea breaks every full and change of the moon, as there is a heavy swell setting in from the west at that time. There are many valuable minerals and precious stones found in and about this river, and I have found a few grains of gold dust at the river's mouth.

"Persons wishing to have communication with this river must land at Voltas Bay, and walk to the banks of the Orange, as there is no landing at or near its mouth in any season of the year, on account of the continual heavy surf that is always rolling in on this from the westward.

"Taking our leave of Orange River, we continued examining the coast to the N. N. W., along a straight shore, clear of dangers, until we came to what is called Angras Juntas Bay, said to have an island at its entrance, and a bay or lagoon within the island, running 6 leagues north and south, completely sheltered from all winds. This I know is not the case, as I have examined every rod of this coast with my boats, in broad daylight, close to the outer edge of the surf on the beach. At the place called Angras Juntas there is a small bend in the land, running in to the eastward about a mile, the width of its mouth being a mile and a half. Here ships may find tolerable shelter, with southerly winds, and it is likewise a convenient place to have communication with the Hottentots, some of whom reside about 5 miles to the north-east of this bay. There is a small rock that stands to the south-west on the south point about two miles, with deep water all round it. At the entrance of this bay there are 14 fathoms water, which gradually lessen to 5 fathoms, about half a mile from the bottom of the bay, sandy bottom. But the best anchorage is under the south shore, one-fourth of a mile from the point to the south-west, in 6 fathoms, sandy ground. This place is situated in lat. 27° 47′ S., long. 15° 50′ E. Page 175.

"WHALE BAY. On September 20th, we arrived at Whale Bay, in lat. 27° 23′ S., which is unsafe for ships to anchor in, on account of the shoal water in every part of it; but they may anchor outside of two small islands which front the bay, lying half a mile from the shore, on which may be taken a few fur-seals, in the proper season. The landing on the south side of the bay is good, and an eligible place for trading with the Hottentots, who inhabit a small village which stands in a pleasant valley, ten miles inland. The coast along here is nothing but one sandy desert, with the exception of a few rocky hills composed of volcanic substances.

"From this place we followed the coast to Elizabeth Bay, which is fronted by Possession Island. The centre of the island is in lat. 26° 57′ S., long 15° 8′ E. Between this place and Cape Voltas there are many small islets and reefs lying half a mile from the shore; but there are no dangers at double that distance from the land; and ships, if becalmed, may anchor 5 miles off the coast, in from 15 to 20 fathoms, sandy bottom. These soundings extend along the whole range of coast.

"Possession Island is 3 miles in length and nearly one mile in width; forming, on the east side, a concave curvature, in which ships will find good anchorage in from 7 to 4 fathoms, sandy bottom, and smooth water. The landing is also good in front of the anchorage, near the centre of the island, half a mile from the beach. There are a few sunken rocks lying off the south point of the island, about three quarters of a mile, on which the sea generally breaks. There is also a reef running off the north east end of the island, about three miles, on which the breakers are frequently very heavy. These reefs both incline to the eastward, which promotes the smoothness of the water in the harbour. Between the island and the continent, or rather between the extreme points of the reefs and the mainland, the channel is three miles wide, with from 15 to 10 fathoms water, sandy bottom and free from dangers. Ships intending to anchor at this island while the south winds are fresh should approach the anchorage from the south, and leave it by the opposite passage. Page 175.

"Angra Pequena Bay lies 17 miles to the north of Possession Island. The westernmost point on the south side of the bay is in lat. 26° 39′ S., long. 15° 7′ 30″ E. This is a high bluff point, rendered conspicuous by a marble cross erected on the summit in 1486, by Bartholomew Diaz, a Portuguese navigator. This monument of his successful enterpize along the coast of Africa is still standing, after having braved the storms and heats of three centuries and a half. About four miles east of this cross is Angra point, which has a small rocky reef, lying N. by E. half a mile from shore, between which and the point there are five fathoms water. But I should advise strangers to pass to the north of this reef, giving it a berth of half a mile. After passing the reef you will open a lagoon running in to the southward, between 4 and 5 miles, the entrance to which is one mile and a half wide; a clear passage, with 7 fathoms in the middle of it, becoming gradually more shallow as you approach the head of the lagoon on either shore. After advancing about three miles up this lagoon, you will find 4 fathoms water, muddy bottom, and here is the best anchorage under the western shore, about a quarter of a mile from the beach. Page 174.

"Two miles E. by N. from Angra Point, and due east of the reef just mentioned, are two small islands, about one mile from the mainland, lying parallel to the shore, which runs here nearly north and south. Neither of these islands exceed a mile in length; but the southern one shelters good anchorage in 5 fathoms, clay bottom. The best situation to anchor in on the east side of the south island is near its centre, about two cables' lengths from its shore, leaving a single rock that lies level with the surface of the water, and nearly mid-channel, about half a mile to the north of this passage. This harbour may be entered and left with perfect safety, either from the north or south end of the island; but I can recommend the southern passage as being the most easy, and entirely free from dangers, 20 fathoms from either shore. The anchorage under the northern island is unsafe, there being several sunken rocks between it and the mainland, which do not always show themselves.

"FRESH WATER. It is reported, and so marked on maps and charts, that this region is entirely destitute of fresh water; and that none is to be found between the 16th and 31st degrees of south latitude. This idea is founded in error; for I have found many places, while travelling along near the sea-shore on this coast, where fresh water may be had in any quantity by digging very shallow wells. To the north of Angra Pequena, about 10 miles, there are many fine springs of excellent fresh water, about one mile from the sea coast, where any quantity of the pure limpid element can be obtained for a dozen ships at a time.

"I can also refute another erroneous statement respecting this coast. It is said there is a dangerous shoal lying between three and four leagues to the west of Angra Pequena, in lat. 26° 35′ S. But I can assert, with the greatest degree of confidence, that there is but one shoal on any part of this coast, south of Spencer's Bay, that lies more than 4 miles from the mainland; and this one lies N. N. W. from Angra Pequena, or Santa Cruz, about 15 miles.

"*October 2nd.* On Thursday we got under-weigh, and steered to the south, to examine a few rocks which lie about one mile off shore from the mainland, and nearly half-way between Possession Island and Angra Pequena, or Santa Cruz. These rocks are small, but evidently of volcanic origin, and have fine anchorage between them and the mainland, in 5 fathoms water, sandy bottom, sheltered from all winds. In going into the anchorage, you pass the north point of the ledge, leaving the rocks on your right hand, half a cable's length distant, and then haul immediately round to the south, and anchor abreast of the middle of the ledge, about mid-channel.

ICHABOE ISLAND. This island, which sometime since obtained so much notoriety for its guano, lies in lat. 26° 19′ S., long. 14° 51′ E. It is scarcely a mile in circumference, and lies about 24 miles north from Angra Pequena, being distant from the shore not more than a mile and a half. The landing place is on the north-east part of the island; but after heavy gales, with much swell outside, there is frequently such a surf for about twenty yards from the shore, as to make it difficult, and even dangerous for a boat to land.

A point of land from the continent extends 3 or 4 miles into the sea, to the south of the island; and from the extremity of this point a reef puts off in a north-west direction, until it nearly meets a reef that projects from the west side of the island. Another reef puts off from the north-east point of the island; consequently a bay is formed, in which a ship might lie all the year round, in perfect safety and smooth water.

Captain Morrell says, "In coming to this anchorage care should always be taken to pass round the north (?) end of the island, giving its north-east point a berth of half a mile, which will avoid all dangers. In working into this harbour the shore on the main may be approached within two cables' length.

"This is a fine place for making captive the great leviathan of the ocean, the *right* whale, great numbers of which strike on this part of the coast about the middle of June. They are in the habit of playing about the reefs of the island, and that which runs from the continental point before mentioned; and as the south wind prevails, there is no difficulty in getting the dead whale alongside the ship. Scale-fish may be caught at the anchorage with hook and line; or at the bay with a seine, in great quantities. An abundance of craw-fish may also be caught with a hoop-net all around the island, within 50 fathoms of the shore.

"SPENCER'S BAY. On Wednesday, the 22nd of October, we anchored on the east side of Mercury Island, in 4 fathoms water, about two cables' length from the island, which is situated in lat. 25° 42′ S., long. 14° 58′ E. It is one mile in circumference, of an oblong shape, lying north and south, and is three quarters of a mile north from the south-west point of Spencer's Bay, and 1½ mile west from the north-east point of the same bay. Both passages are easy, and free from dangers; and the best anchorage is on the east side of the island, about 150 fathoms from its shores, in 5 fathoms water, sand and clay bottom. I would not advise ships to anchor on the south side of the bay, as a heavy westerly swell heaves into it on the full and change of the moon; but let them anchor close under the island, and they will lie perfectly safe in smooth water."

The south point of Spencer's Bay presents several high peaked rocks, nearly 600 feet perpendicular, at the water's edge. Whales frequent this bay in considerable numbers, in the months of July and August. The shores and surface of Mercury island present many specimens of volcanic productions, as do also those of the continent in this vicinity, extending some distance into the country.

There is a Hottentot village, about 40 miles on an E. by S. course from the head of the bay, containing about 250 inhabitants, and situated in a fertile valley, watered by several springs of excellent fresh water. There are also four refreshing springs between the village and the bay.

Here Captain Morrell had the misfortune to loose one of his men, while engaged on the island skinning the seals they had caught. His loss was caused by the sudden rising of the rollers, so frequent on this part of the coast. Page 174.

Captain Livingston says that there is an excellent bay, not laid down in any chart, lying to the north of Spencer Bay. It was discovered by the Gallovidia schooner, R. Rae, master, who states its latitude (rather doubtfully ascertained by stars) to be 26° 08′ S. The bay affords shelter from north-east to south-west, with good holding ground on blue mud and sand. It is about 2½ miles wide and 3 deep, and in honour of the discoverer may be appropriately named Rae's Bay.

HOLLAM, OR BIRD ISLAND. This little island, which is not more than the fourth of a mile in circumference, is in lat. 24° 37′ 24″ S., long. 14° 27′ 10″ E., lying about three miles from the mainland. A reef of rocks runs off from it in a south west direction, about 5 miles, on which the sea often breaks with great violence. A vast number of right whales frequent this reef in the months of July and August; and a ship may lie at anchor on the north side of the island in 10 fathoms all the whaling season, in perfect safety, if she has chain cables. This island is resorted to by seal, gannets, and penguins; and here Mr. Morrell took 1400 skins of the fur-seal, at one time, although the landing was bad. The passage between the island and the continent is about nine miles wide, free from hidden dangers, with 20 to 10 fathoms near the mainland.

ALLIGATOR ROCKS. Captain Morrell says of this reef—"The Alligator Rocks, as laid down in the chart, I could not find, after two days spent in the search. I therefore conclude that there is no such reef, but that Bird Island has been seen in a haze, and mistaken for a danger which does not actually exist. The extreme haziness of the weather, peculiar to this coast, might very easily have deceived Captain Wood, of H. M. S. Garland, for I have frequently been running along this coast, not more than one league from the land, when the sandhills, which line this part of the coast, have appeared to be 5 or 6 leagues from the vessel."

Sandwich Bay. Captain Morrell says—"On Sunday, the 16th of November, we left Bird Island, and continued our examination of the coast to the northward, with a gentle breeze from S. by W., and fair weather.

"On Tuesday, the 18th, we arrived at the mouth of what is called Sandwich Harbour, said to have 3 fathoms water in its channel of entrance, although we found only 11 feet at high water in this channel. I have no doubt there was a time, some years back, when its depth was full three fathoms, and that it has been filled up by drifts of sand, the movements of which along this coast forcibly reminded me of the snow-drifts of my native country, every fresh southerly wind forming new sand-hills, exactly as new snow-banks are formed at home, by a fine clear North-wester.

"This lagoon runs to the southward, about two leagues, with 7, 5, 3, and 2 fathoms, nearly all over it. It is formed on the east by a high white bluff sand hill, and on the west by a low sandy peninsular nearly level with the sea, with shoal water on the seaboard side for more than a mile to seaward. The entrance of the lagoon is very narrow, being not more than a quarter of a mile wide, and formed by two low sandy points, situated in lat. 23° 35′ S., long. 14° 28′ E. Variation per azimuth in 1828, 23° 15′ westerly.

"Perhaps there is not a finer place on the whole coast than this for taking fish with the seines. Many different kinds of fish resort to this lagoon, one of which bears a strong resemblance to our "streaked bass," and is as fat and delicate flavoured fish as our salmon. There are many other sorts equally good, but of a smaller size. Many cargoes of fish might be taken from this lagoon in a short time, and they would sell for a good price at St. Helena, Cape of Good Hood, Isle of France, or the Isle of Bourbon. Green turtle also visit the sandy beaches for the usual purposes."

Walwich Bay.—Captain Morell thus describes it. "On Saturday, the 22nd, we arrived at Walwich Bay, the west point of which is very low. The entrance to the bay is one league broad, running to the south two leagues; one league and a half of which is navigable, and the depth of water in going in is from 12 to 3 fathoms, mud and clay bottom, near the head of the bay.

"The east side of this bay is formed by moderately elevated sandhills, near the sea shore, and the west side is formed by a very low sandy peninsula, not more than 15 feet above the level of the sea at any place. The isthmus is very narrow, it being not more than 20 rods from the head of the bay to the sea shore. The peninsula, however, is from one to three miles in width. In entering this bay, it is necessary to give the west point a good berth, of nearly half a mile on account of a sand-bank that runs off from it, in a N.N.E. direction about a quarter of a mile, on which there are only 6 feet at low tide. After doubling this point, in advancing up the bay, it is proper to give the western shore a berth of one-fourth of a mile; taking care not to approach it at any nearer, as the water becomes shallow very suddenly, from five fathoms to two, and even to four feet, at low water. This is a mud bank, which stretches all along the western and southern shore of this bay; but the eastern shore is bold, one cable's length from the beach, nearly to the head of the bay. The water is entirely smooth all over the bay, and consequently it is a safe as well as a spacious harbour at any season of the year. "Page 174.

Simons Bay—Cape of Good Hope. A light vessel has lately been moored in 7½ fathoms, off the Roman Rocks, in this bay. It is painted red, and carries a revolving light at an elevation of 37 feet above the level of the sea. During the day time a red flag (or perhaps a ball,) is shown when vessels are observed. The following are the bearings —the Roman Rocks, South a cable's length; the Whittle Rock S.S.E. 7 miles; Seal Island E. ½ S. 6¾ miles; Millar Point S. ¾ W. 3¾ miles.

Mr. J. Brown, the master of H. M. S. Winchester, has drawn up the following sailing directions:—

"When a vessel has rounded the Cape of Good Hope from the westward, the above mentioned light will open clear of Miller Point on the bearing of N. by E.; and, if it be intended to work up False Bay, between the Whittle Rock and the western shore, the light should not be brought to the westward of N. by W. ¼ W., until she is well up with the high land about Miller Point, and consequently to the northward of the Whittle; nor should the light be brought at any time to bear to the eastward of north, on account of the rocks off the western shore.

"If the vessel is to work up to the eastward of the Whittle, the light should not be brought to the north of N. N. W. ½ W., in order to avoid that rock; nor to the westward of N. W. by W. ½ W., so as to give a sufficient berth to Seal Island and the shoal near it. But by whichever of those channels a ship approaches, short tacks should be made until certain of being within 5 miles of the light.

"With a leading wind the light may be brought to bear N. by W., which will clear the Whittle; and that course should be continued till within a mile of the light. The light vessel must then be well opened on the port bow, so as to round her at not less than half a mile distance. When the light has been brought to bear S. S. W., steer in west for the anchorage, and bring up in 14 to 10 fathoms, according to the weather.

"When coming from the eastward round Cape Hanglip, it will be observed that the Whittle lies nearly in a direct line between the Cape and the light; and therefore, if the wind be fair, bring the light to bear N. W. by N., and steer for it.

"These instructions are intended for seamen not acquainted with Simons' Bay; those who know the passage between the Roman Rocks and Noah's Ark, will probably adopt it in the day time, but from the position of the Phœnix Rock, and the narrowness of the passage, all ships at night should pass to the eastward of the light vessel, and haul round her to the northward." Page 182.

COAST OF BRAZIL.

CIARA. On Point Macoripe, eastern side of the entrance to the bay, in lat. 3° 41′ 10″ S., and long. 38° 35′ 9″ * W., has lately been established a fixed light, 37 feet above the sea, visible 10 miles. Page 233.

MOUNT ITACOLUMI. On the cliff of Mount Itacolumi is erected a light house. It is a quadrangular building, the sides of which face the cardinal points. The light, shown at an elevation of 147 feet from high-water mark, revolves, shewing a light of two colours, one being of the natural appearance, the other of a red colour, being alternately visible and invisible for about two miles in each revolution. Care should be taken not to mistake this light for the one on Isle St. Anna. Page 241.

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* It should be remarked that the charts give the longitude of Point Macoripe, as 38° 30′ W.

BANK OFF CAPE SAN THOME. The following extract of a letter from Captain Jervis, of H. M. S. Pilot, dated Dec. 13th, 1843, is taken from the Nautical Magazine, 1844. Page 243.

"On December 6th, a. m., running for Rio, found the water very much discoloured, sounded in 35 fathoms, sand, at 10h. sounded in 25 fathoms; at noon lat. 21° 44′ S., long. 39° 35′ W., then 16½, shoaled the water, gradually, until we had in the starboard chains 15 fathoms; in the port chains barely 9 fathoms. This continued until 4h. p. m., and then shoaled to 12½ fathoms, going three knots, breeze increasing, then deepened to 16 and 17, and shoaled again to 12½. At 4h. no bottom with 20 fathoms, at 5h. leadsmen in. Lead hove every half hour till midnight. Cape Frio bearing at noon S. W. by W. ½ W. 140′; C. San Thome W. ½ S. 80′; Esperitu Santo N. N. W. ½ W., 109°. Page 275.

RIO JANEIRO. SHOAL AT ENTRANCE. From the Nautical Magazine, 1846. Page 321.

"The ship in which I was passed directly over a shoal, the position of which, as I do not see it marked on any chart I have examined, I beg here to make known.

"Bearing of Sugar Loaf N. 7° E. true, distance about 24 miles, extent about 200 yards in diameter. Bottom, sand and rock. There were no soundings taken, but I should think there cannot be less than 8 fathoms over it. *J. C. Haile.*" Page 279.

"SANTOS. On Moela Island, near Santos, is said to be a fixed light shewn 105 feet above the level of the sea, and visible about 12 miles. Page 291.

RIO GRANDE. The tower, or lighthouse, is in lat. 33° 8′ S., long. 52° 10′ W. When you make the tower, endeavour to get it to bear north 5 or 6 miles, then steer direct for it, but be particular to observe if a red flag be hoisted on the tower; if so, it signifies that you must approach and continue to advance (as long as the flag is up,) direct for the tower, until you see a boat, which will be at anchor on the bar, in which a pilot will be situated to show flags, which represent the depth of water on the bar as follows:—

A blue flag over a red flag,	10 ft.
A red flag over a blue flag,	10½ ft.
A blue pendant over a white flag,	10 ft. 10½ in.
A white flag over a blue pendant,	11 ft. 3 in.
A blue pendant over a blue flag,	11 ft. 7¾ in.
A blue flag over a blue pendant,	12 ft.
A blue pendant over a red flag,	12 ft. 4½ in.
A red flag over a blue pendant,	12 ft. 9 in.

Steer for the boat, guiding yourself by a staff with a flag, which is inclined by the man in the boat as follows:—If the staff is held upright, it denotes you are steering correctly. If the staff be inclined to be port or starboard, you may luff or keep off accordingly. If the flag on the tower is hauled down you must not approach. From the tower they also throw out laurel flags, particularly in rough weather, to guide vessels keeping off, or luffing, according as the flags are shown to north or south.

There is good anchorage 6 miles from the tower, which bears N. 6 miles distance; but as a general rule it is best to avoid anchoring. At night, keep in 10 fathoms water, or over, and be very careful to sound frequently when your head is to shore. The soundings diminish reguarly to 5 fathoms, which is close to the breakers. On the beach to the south of the bar the water decreases gradually, but to the northward, it shelves more suddenly. Pilotage inwards or outwards over the bar, 280 rees per ton. Up to the harbour, 816. Anchorage, 50 rees per day, per Brazilian ton. Consuls' fees, 87, 25. *Shipping Gazette*, 1845. Page 298.

RIO DE LA PLATA. SHOAL AT ENTRANCE. Extracted from the Nautical Magazine, 1846. Page 320.

"I beg leave to inform you that the Nautilus Transport, on her passage to Monte Video, struck on a sunken rock in the river de la Plata, between the Isle of Flores and the Carretas reef; the lighthouse on the S. W. end of Flores bore E. by S. ½ S., the high land about Bold Point W. by S. ½ S. The ship passed over, having struck four or five times. Immediately the anchor was let go, and the boat sent away, and found 17 feet water on it, and 5½ and 6 fathoms close to it. I believe that the rock is laid down in the Spanish charts, and that H. M. S. Nereid struck on it many years ago. W. C. Saunders, *Agent for Transports*. Page 303.

ORTIZ BANK. Off the S. E. part of the Ortiz Bank is now a floating light. Page 317.

COLONIA. Here there is reported to be a light, but we have not the particulars. Page 318.

STRAITS OF MAGELLAN.

The following recommendation to ships to use this passage lately appeared in the Shipping and Mercantile Gazette. "On Monday, Nov. 16th, 1846, at 8 p. m., we made the Evangelists bearing N. N. E. 5 miles, wind W., and tolerably clear; at midnight, Cape Pillar bore S. S. W., 3. miles, and by keeping the starboard shore on board strangers will find no difficulty in finding Long Reach. On Tuesday, the 17th, at noon, we entered Crooked Reach; at 10 p. m. were off Port Famine, which is a safe anchoring ground, and where there is a Chillian settlement, at which refreshments can easily be procured. On Wednesday, 18th, at 4. 30 p. m. came to anchor in Gregory's Bay, in 15 fathoms good holding ground. On Thursday, 19th, at 3. 30 a. m., got under-weigh; at 7. 30 a. m., entered the first narrows, with a strong flood tide against us, which we found no difficulty in stemming; at 2 p. m. we were clear of the Straits; at 6 p. m. we rounded Dungeness. After the experience of four voyages round Cape Horn, in September 1843, August, 1844, August, 1845, and the present voyage, I must say that the wear and tear, owing to the bad weather we encountered, with the heavy cross sea, so prevalent between the west entrance to the Straits and Cape Horn, contrasted with the passage through the Straits *from the west coast*, is, in my opinion, not to be compared; and had I another passage to make at some season of the year, or in the winter season, with moonlight, I would take the Straits for my passage; the risk of life and property, and the wear and tear in the one, is not be compared with the other. Page 322.

(Signed) JOHN LONGMUIR, Master,
36, Upper Pitt-street, Liverpool, February 16th, 1847.

THE
ATLANTIC NAVIGATOR.

NOTE:—THE BEARINGS AND COURSES ARE THOSE BY COMPASS, UNLESS EXPRESSED TO THE CONTRARY: BUT THOSE GIVEN THUS (E. N. E.) SIGNIFY THE TRUE; AND THE GIVEN DIRECTION OF WIND, TIDE, AND CURRENT IS ALWAYS TO BE CONSIDERED AS THE TRUE. THE DEPTHS ARE THOSE AT LOW WATER, SPRING TIDES; AND THE MILES, GEOGRAPHIC, SIXTY TO A DEGREE.

In our Sailing Directions for the English Channel, the Coasts of England and France have been minutely described, and consequently to repeat the description would not be consistent with the limits of the present work. But as it is possible that a ship may be driven, by stress of weather, into the Bay of Biscay, a few remarks on its harbours may not be misplaced.

SECTION I.

FRANCE, SPAIN, AND PORTUGAL.

ISLAND OF USHANT is about 4 miles in length from east to west, and two miles in breadth. It is a steep craggy island, with a harbour on its S. W. side, difficult of access. On the N. E. part of the island is a light-house, exhibiting an excellent fixed light, elevated 265 feet above the level of the sea, and which may be seen in clear weather at the distance of 7 leagues. On the north side of the island is Beninon, a small bay sheltered by an islet named Queler, where small vessels may lie sheltered during all winds but those from the northward. At the distance of 4½ miles N. W. ½ W. from the light-house, and about 3½ miles N. ¼ E. from the west point of the island is the Basse Calais, a bed of sunken rocks, which is dangerous; and, at the distance of a mile from the S. W. point, lies the Jument rock, which is alternately covered and uncovered with every tide.

PASSAGE DU FOUR. To the westward of Ushant is the Passage du Four, through which the French coasters pass to Brest, &c.; and to the southward of the island is the Chenel de Frotueur. The latter is little more than a mile in breadth, and the tide runs through it very rapidly, generally exceeding the rate of four knots. S. S. E. of the Chenel de Frotueur there is a range of islands, in eight groups, surrounded with shoals and rocks, and extending to the distance of 4 leagues. Of these dangers the westernmost are Pierre Verte, a bank of rocks that appear at low water, spring tides, and Le Boufouloe, or the Buffalo; close to the latter are 8 fathoms, hence to the Black rocks and Chimneys, upon the easternmost part of the range, the course and distance will be S. S. E. ¾ E. nearly

3 miles; depths from 12 to 29 fathoms. The Pierre Verte, or Green Stone, lies 5 miles S. S. E. ¼ E. from the S. W. end of Ushant; and the Buffalo S. S. E., 10¼ miles from the same point.

BREST. From the Chimneys, or southernmost Black rocks, to St. Matthew's point, the course and distance are nearly E., 5 miles. From this point to the entrance of Brest harbour the course and distance are nearly E. N. E., 3 leagues; but as there are several dangers off the coast, the land-marks, &c. must be attended to. On St. Matthew's point is a light-tower, which exhibits a revolving light; the eclipses succeed each other every 100 seconds; its height above the sea is 167 feet, and it may be seen at 6 leagues off. Off the rocks lying in the vicinity of the more dangerous ones, being, at a distance from the land, are the Vaudree, Gouemont, and Parquette; the latter, which is the inner one, becomes uncovered at half-ebb, and generally has breakers upon it when covered; it lies 4 miles S. ¾ W. from St. Matthew's point. To the eastward of this rock the ground is foul, quite up to the Toulinguet rocks, which lie off the west point of Camaret, and render that shore dangerous. The Gouemont lies 1¾ miles to the westward of the Parquette; this shoal has only 10 or 11 feet over it at low water. The Vaudree lies 3 cables' length to the west of the Gouemont and has 14 or 15 feet over it. On the north side of the channel to Brest, the dangers are the Coq, the Buzee, &c. The former is a sunken rock, lying at the distance of three-quarters of a mile from shore, about 2 miles to the south-eastward of St. Matthew's point, with the south end of the isle of Beniguet on with that point. The Buzee lies about one mile and a quarter E. S. E. from the Coq, and is very dangerous to large ships.

In Sailing for Brest, you will pass to the southward of the Coq, by steering about S. E. from St. Matthew's point, taking care to keep the north end of the isle of Beniguet open with it, until the mill upon the land to the northward bears N. by W. and the trees N., when you will have passed the rock. The Buzee may be passed on either side; but the best way is to run to the northward of it, and along shore; at the distance of two cables' length from the latter, and thus sailing S. E. by E. ¾ E. across the entrance of the bay of Bertheaume. In approaching the Gullet, be careful to avoid the Fillettes, Mingan, and other rocks, which lie in mid-channel off the peninsula of Camaret; and carefully avoid also the Bagine, or Kergutio rocks, lying near the entrance of Brestwater, at about two cables' length from the north shore. Vessels may pass on either side of them, but the common passage is to the northward. When the town of Brest appears open of Perzie point, you may steer for it, and anchor in 8 or 9 fathoms, or more to the southward, in from 15 to 10 fathoms. In Bertheaume bay, about 4 miles to the eastward of St. Matthew's point, there is good anchorage with off shore winds, in from 8 to 11 fathoms; this is called the outer anchorage.

DOVARNENEZ BAY lies to the southward of Brest harbour. Its entrance is so wide, and its bottom is so clear and regular that no leading mark is required, provided that a sufficient berth be given to several rocks which lie on the north side. The course and distance from the S. W. end of Ushant to this bay are S. S. E. ¼ E., 10 leagues. There is nothing in the way that can take a ship up, only observing to avoid the Basse Vielle, off the Bec de Chevre, on the north side of the entrance. This rock lies about one-third over from the point, and appears just above water at two-thirds ebb. It is steep-to, having from 17 to 12 fathoms close to it. The marks for it are, a mill to the westward of St. Laurence's church on with the middle of a reef of dry rocks which lie off the point, or Bec de Chevre, bearing E. by N. ½ N.; and a village on with the N. W. cliff of the same point, bearing N. E. by E. Its bearing and distance from the point are W. ¾ S., 1½ mile. A clump of trees, with a little chapel in the midst, stand on the north side to the eastward of Point Chevre, having a windmill to the westward, and two to the eastward. With the windmill, next to the eastward of these trees, just open of Chevre point, you will have passed the Basse Vielle, and may steer for what part of the bay you please. The best ground is however considered to be that towards the north side, being clear sand, with a depth of from 9 to 15 fathoms.

THE ISLE OF SAINTS lies 4½ miles W. N. W. of Bec du Raz, or Race Bill, having a channel between of 15 to 18 fathoms, sandy bottom; the latter, however, must be given a good berth, as several high rocks lie to the W. N. W. of it; the highest of these is called the Vielle, being the farthest from the land, and having a rock under water, called La Platta, lying half a cable's length from it. The isle of Saints has a flat appearance; two ledges of rocks lie to the S. E. of it, that nearest the island named Le Pont du Chat, and the other Cornet; a ridge of rocks likewise stretches from the west side of the island, full 3 leagues into the sea, called the Saint's Bridge; the greatest number of these are under water. The Stevenot is a high rock, lying 2½ miles E. N. E. ½ E. from the isle of Saints, and about the same distance from the Bec du Raz; it is surrounded by several rocks, under water, and great caution is required to avoid them.

Port Casbestrans is about two leagues S. E. from the Raz; the entrance to the road is between two rocks, which dry at low water; but as it is a by-place, vessels but rarely anchor here.

Hodierne is a tide port, and must be entered at high water; the rocky bank of La Gamette lies before the port, about a mile distant from the shore, at either side of which vessels may safely pass, by keeping near the land. Hodierne is well sheltered when within; the town lies on the western side, and a high church stands on the east side of the port.

THE PENMARK ROCKS form the extensive group of dangers that surround Penmark point, and the coast to the eastward; on the point is a provisional light, upon the tower of the church of St. Pierre, which revolves, and is eclipsed every half minute. It height is 42 feet above the sea, and it may be discerned at 4 leagues off. The dangers about the point extend outward to the distance of half a league.

QUIMPER. To the westward of Quimper river, is the river du Pont L'Abbe, accessible only at high water, and barred with banks that leave a small channel only. Hence, to the river Quimper, the coast is bordered with rocks, which extend to the distance of two cables' length into the sea. The mouth of Quimper river is of sufficient breadth, but a sunken rock lies before it, at the distance of three-quarters of a mile, which should be approached with great caution. The best passage is on the western side. Between Quimper river and Conquerneau are many rocks along shore, at various distances; of these, several lie at the entrance of the harbour, leaving only a small channel between them; but there is anchorage here in 4 and 5 fathoms. High water, on the full and change, at 4 o'clock.

THE GLENAN ISLANDS lie about 9½ miles without Conquerneau, they are encumbered with several rocks, above and under water; the north side, however, is clear, as you may sail near the largest of the group called Glenan, and anchor in 9 and 10 fathoms: but strangers should not attempt the passage, as many sunken rocks lie interspersed. On the 1st of October, 1838, an intermitting light was exhibited on a tower recently erected at the north point of the isle of Penfret, one of the Glenan islands. The light is 72 feet above the ground, and 118 feet above the level of high water, at equinoctial spring tides; it will be seen, in clear weather, at the distance of 5 leagues. Bright flashes regularly succeed each other every four minutes, and last about 8 or 10 seconds. The faint light, which will be perceptible during the intervals, will be preceded and followed by short eclipses. There is but little apparent difference between this new light and that near Noirmoustier island, on the Pilier, in lat. 47° 2′ 26″ N., and long 2° 21′ 32″ W.; but there will be no danger of mistaking the one for the other, as it is not probable that any vessel from seaward should arrive in sight of Penfret light, without having previously seen either the light of Belle isle or that of Penmark. About one league, north from the Glenans, are the Moutons, or Sheep islands; between are the Les Porceaux rocks, surrounded by several others. Southward of the Glenan islands, is the Jument rock, over which the sea breaks; this ought to be given a good berth.

PORT LOUIS is an excellent harbour, distant 24 miles from Conquerneau; but the entrance is rendered difficult of access, by numerous rocks. The mark for entering is, the edge of the citadel in a line with the little convent of St. Catherine, and anchor within the citadel in 5 or 6 fathoms. The isle of Grouais is nearly 4 miles long, lying S. W. by W. of the entrance of Port Louis. Between the island and the main there is a bank of 2 fathoms, at low water, lying nearer the latter; vessels may anchor between this bank and the island in 10 to 15 fathoms, good ground. A reef of rocks, called the Bouts des Chats, or Cats' End, lies off the S. E. end of the island, which must be avoided.

L'ORIENT stands about 2 miles above Port Louis, at the bottom of the bay formed by the rivers Platscorf and Blavet. Sailing from Grouais island, or the offing, to pass westward of the Trayes or Sows and the Errants, which is the great channel, keep Larmer tower E. N. E. till one of the mills standing eastward of Port Louis comes hid of the southern part of the town walls, and the other mill comes well open; then sail in mid-channel between the Saisies of Larmer and the Sows; this mark is to be kept on until the high land of Pennemané is in one with the west corner of the citadel of Port Louis, then steer in that direction until the west point of St. Michael's comes on with a white mark, lying to the westward of the storehouses of L'Orient harbour; this takes you between the Mare and the foot of the citadel. The Mare is covered at three-quarters' flood, and has a beacon on it. The westernmost of the Sows has also a beacon; these rocks are visible at spring-ebbs, and covered at half-tide. The Saisies of Larmer are covered at three-quarters' flood; but the Errants are always visible.

When past the Mare you may either sail to the eastward or westward of St. Michael's island. Proceed through the western passage, until Queroman's house is in one with the miller's white house by the mill near shore, leaving on the starboard a rock of 12 feet, and on the larboard another called the Hog, covered at half tide, and marked by a beacon. You will thus pass between the Turk and the Querneval bank; the former has a buoy at its southern extremity, and has only 2 feet water on it. Sail on in the above direction, until you have the white mark of the storehouse in one with a single house on the beach till athwart of St. Michael's, when you may proceed for the road of Pennemané, leaving the half-tide rock, named Pengarne, on which is a beacon, on the starboard side. The mark for the eastern passage is, the corner wall of St. Catherine's garden in one with a white house standing in the middle of Nezenel town; this takes you athwart of the south end of St. Catherine's, and should be kept on, until the little wood of Querbel, near Port Louis, is seen through the causeway, or stone bridge, which joins St. Catherine's to the main. You will thus pass the Pengarne, which is to be left on the starboard, and, when you are a ship's length within it, proceed for the road. It is, however, to be observed, that vessels drawing more than 21 feet cannot make Pennemané road, unless at high water, spring tides; in that case you must anchor at Port Louis.

In passing the Errants, by mid-channel, it will be necessary to bring L'Orient tower in one with the western bastion of Port Louis citadel, at as great a distance as possible, by which you will leave the Errants on the larboard, and the Bastrene rock, with its buoy, on the starboard side; you will also pass the Three Stones, having another buoy; and, when you have proceeded so far as to bring the Fountain, on the beach of Gavre, in one with the single tree N. E. of the village, keep Larmer windmill on with two houses nearest the Point of Larmer; you will then enter the great channel, at the point from whence the high land of Pennemané may be seen in one with the western corner of Port Louis citadel, and may proceed as already directed.

BELLE ISLE. The Birvideaux bank lies between Grouais and Belle isle; a beacon was placed on this bank in 4 fathoms, with the S. E. point of Grouais bearing N. by W. and the N. W. point of the same island N. N. W. ½ W. BELLE ISLE is about 3 leagues in length, it is high and steep-to; on the south side are numerous rocks, above and under water, lying near the shore. The COLTS are rocks of a similar description, extending from the N. W. point; that furthest from the shore is the highest and largest of the group. The town and harbour of Palais lies on the north side of the island, and is the most frequented, although Sauzon, which lies a little above it, is a much better harbour; other good roads may be found, but principally on the north side.

A LIGHT-HOUSE has recently been erected on the S. W. part of Belle isle; it exhibits a revolving light, which is eclipsed every minute during the night. Its height above the level of high water, at equinoctial spring tides, is 276 feet, and may be seen at the distance of 8 leagues. That this light may not be mistaken for that on the Plateau du Four, it is to be remarked:—1. That the light of Belle isle is much more brilliant than that of the Four. 2. That it presents, between the flashes, a fixed light, which may be seen in ordinary weather, at a distance of more than 3 leagues, at which distance the eclipses of the Plateau du Four will be total. 3. That the elevation of the light of Belle isle exceeds by 220 feet that of the Plateau; and further, that on approaching the former, the high land of the island may be distinguished at night. Again, it is not to be supposed that a vessel standing in from sea can make the light of the Plateau du Four without having seen either that of the isle d'Yeu, or of the Pilier, or the one on Belle isle.

PALAIS, IN BELLE ISLE. HARBOUR LIGHT, on the head of the great Mole, and on the left of the entrance of the port, latitude 47° 20′ 53″, N. and longitude 3° 9′ 7″ W., elevated 16 feet above the level of high water, and seen, in clear weather, at the distance of 3 miles.

QUIBERON. From Port Louis to Quiberon the distance is about 17 miles. The coast is encumbered with many rocks, partly under water; and off Quiberon are several that stretch as far as the isle of Houat, which lies about 6 miles to the southward, and is about 3 miles in extent. In the channel stands the high rock called La Teignoure, which serves for a mark to pass between Houat and Hedic; but this passage is not to be recommended, as it is both narrow and dangerous. The N. and S. E. sides of Houat have several rocks near them, and the channel between it and

Quiberon is small. Hedic (having a fixed light) is rather of a circular form, surrounded by rocks, distant about 4½ miles from Houat. The Cardinals lie off the S. E. part, distant nearly a mile, and some of them are always visible; these must be passed about a mile to the eastward, in sailing for Auray, Vannes, Vilaine, or the Crosic: the tides here set very strong. The course from the east end of the Cardinals, for the Rivers Auray, or Vannes, is N. ½ E. 4½ leagues, (the entrance to both being the same,) on the west of which is a rocky bank, with the small islands of Mehan, that extend 3 miles from the land, in a southerly direction: having got within these islands, which are left on the larboard, proceed towards the eastern shore, in 7 and 8 fathoms, and when within the east point you will perceive the two rivers; these have always a rapid current, and should not be attempted without a pilot. Vessels may anchor within or without the entrance to these rivers; taking care to avoid the Bass St. Gildas, a bank on the eastern shore, about a league S. E. of Mehan isles, and opposite the high steeple of St. Gildas. It lies a mile from the land, but there is no channel between them.

Between Point du Grand Mont, or St. Gildas and Point Dousey, there is a rock under water. The coast, from the latter point to the river Vilaine, trends E. S. E. 12 miles; and the course from the east side of the Cardinals is E. N. E. 15 miles; you will meet the Island of Dumet in the way, and, sailing on its western side, you may steer anywhere, within a cable's length of the land, until the river opens; keep then in mid-channel, as some rocks lie at the east side of the entrance; and, when within these, you may anchor or run aground. If you pass Dumet on the east, beware of some sandy points that stretch out nearly a mile, and must have a good berth given them; this river, as well as the former ones, will require a pilot, who you will readily obtain at the Cardinals. The point of Crosic, which lies about 3 leagues to the southward of the entrance of Vilaine river, will be known by the high pointed steeple of Guerande, and another, built of stone, called the tower of Bass, &c.

NANTES. The navigation to the Loire, or river of Nantes, has been materially facilitated by a new light-house, erected on the northernmost dry rocks of the Four bank; and a tower on the Turk rock, or S. E. end of the La Blanche shoal. The Aiguillon light-towers, on the north side of the Loire, serve as the leading mark into the river; and when in a line bear N. E. by E. The lower one, named Tour d' Aiguillon, exhibits a fixed light, 111 feet above the level of the sea; and, in clear weather, may be seen 5 leagues off. The upper tower, named Tour du Commerce, shews a flashing light, at intervals of 3 minutes; it is 127 feet high, and, in clear weather, can be seen 5½ leagues. The light-house on the Four, stands at 3½ miles W. N. W. from Crosic point, and about 18 miles E. S. E. ¼ E. from the S. E. end of Belle isle; it exhibits a revolving light. The common passage into the river Loire, is to the northward of the dry rocks, on the north end of the Four bank; and thence passing between the reefs which lie off the point of Crosic; only taking care not to approach too near them. The S. E. part of Le Four will be avoided by keeping the church of Crosic well open to the west of the steeple of Guerande; and the N. W. end of La Blanche will be cleared by keeping the steeple of Guerande a sail's breadth to the N. W. of the tower of Batz. Either of these marks may be kept on, until the new light-house, on the Four bank, bears N. W. ½ N., and this line of bearing, or a course S. E. ½ S., will lead directly to the bar of the Loire, until the towers of Aiguillon appear in one, which is the leading mark over the bar, as before mentioned.

To the S. E. of the Crosic the shore is rocky, and there is a reef, called the Louvre rocks, at the distance of half a mile from shore, and nearly 4 miles S. E. from Crosic point. Between this reef and the Three Stones, on the N. W. end of La Blanche, or the Turk bank, is the passage. The course, to abreast the Pierre Perce, or Pierced rock, is therefore S. E. and S. E. by S. Steer so as to leave this rock at the distance of half a mile, on the larboard side, and then continue a S. E. course (allowing for the tide, which runs strongly,) until you bring the two light-houses of Aiguillon in a line, or the high light a little open to the right of the lower one; steer in the latter direction, with the light-houses nearly in one, until you come near to Leve point; next proceed on an E. course, to pass the point of La Villa Mardin, taking care not to bring a pyramid, which stands to the S. W. of the lower light-house, in a line with it; as thus you will avoid the rocks which extend from the point of La Villa Mardin, and will sail clear of the Morees which lie half a mile south from that point. Hence, you may proceed to anchor in Mardin road, E. S. E. of St. Nazaire, in from 6 to 3½ fathoms. If proceeding hence to Nantes, the ship must be conducted by a pilot.

On sailing out of the river, proceed westward, and pass within half a mile of the fort of La Villa Mardin, taking care not to bring the pyramid on with the lower or westernmost light-house. You may pass De Leve point within a quarter of a mile; and, when you have brought the light-houses nearly in one, run out in that direction, between the Turk and La Couronnée. The dangers in the vicinity of the Loire, are the Turk, a sunken rock, with a few others to the N. N. W. of it, which are uncovered at low water; the Turk lies 8 miles N. W. by W. from St. Gildas Point, on the south side of the Loire. The Three Stones, uncovered, and now distinguished by a beacon, lie at the distance of a league and a half W. S. W. from Pain Chateau point. The bank, which connects the Turk and Three Stones, is commonly called the Turk bank, and has but little water upon it; close to its western side are 11, and to its eastern side 6 fathoms. La Couronnée is a dangerous sunken rock, steep-to, with 10 fathoms close to it. La Lambarde is a rock, even with the water at low spring ebbs.

On the N. W. side of the entrance of the Loire is the Leven, a rock nearly covered at half tide, upon which a bank of sand is always visible. Pierre Piercée, an islet, elevated about 30 feet above low water; at about a quarter of a mile to the S. E. of it is the Longue Folle, a sunken reef, on which there are only 7 feet of water, at low spring tides. The Grand Charpentice, Petit Charpentice, and La Vielle, are three rocks, of nearly equal height, and even with the sea at high water of neap tides. Les Morees and La Traye, or the Sow, appear to be about 8 feet high, at low water, neap tides. High water, on the full and change, at 3¾ h. The sea here does not rise gradually during the coming up of the tide; in the first hour it rises 2 feet; the second 3 feet 6 inches; the third 4 feet; the fourth 2 feet 6 inches; the fifth 2 feet; and the sixth one foot.

BOURGNEUF BAY. Point St. Gildas and Pilier islands form the north and south points of this bay. On the N. W. point of Pilier, at 2½ miles from the N. W. point of Noirmoustier there is a light-house, from which is exhibited a light, which presents the appearance of a fixed light, but it is varied by a brilliant flash every 4 minutes; it is 105 feet high, above the level of the sea, and may be seen at 5½ leagues off. The course from Belle isle to the bay of Bourgneuf is S. E. for the isle Pilier, which is distant about 2 miles from that of Noirmoustier; and when you are 3 or 4 miles to the northward of Pilier, steer E. by S. until the convent and Noirmoustier castle come in one; this mark will carry you past the

Monk's bank; a S. E. course will then take you to the Monk's stone, which you may pass on either side; and when abreast of Grave, anchor in 6 or 7 fathoms. A pilot from hence to Bourgneuf will be necessary.

THE ISLE DIEU. A good distinguishing mark for this island is the church which stands upon it, having a pointed steeple; several rocks lie off the west side of the island, called Les Cheins Perrins, that stretch about two miles from the land; and others, named Les Filles, lie towards the N. W. end, somewhat nearer the shore; the south side, however, is clearer, and may be approached as near as you please. There is a small harbour on the N. E. and another on the S. W. side of this isle; but they are only fit for small craft, and dry every tide. The best anchorage off the island is with the west point bearing W. and the east point S. by E., or bring the church to bear S. S. W., distant about 3 miles. With the north point of the island, bearing W. by. S. and the S. E. point S. ¾ E., you may anchor in 9 fathoms, small stones and sand. In sailing from Pilier island to the isle Dieu, you must take care to avoid the Beufs, or Oxen; these lie about S. S. E. from Pilier, and should not be approached nearer than 14 fathoms, as they are steep-to, having 9 and 10 fathoms close to them.

Lights on Isle Dieu. On an elevated spot at nearly a mile from the N. W. end of the isle, is a tower which exhibits a brilliant fixed light, at 164 feet above the level of the sea, and which may be seen 7 leagues off. At the port of Breton, on the north side of the isle, there are likewise, two small harbour lights, fixed; of which the first is on the extremity of the jetty, on the starboard side, when entering the harbour, and the other is on the opposite shore. They are of unequal height, being respectively of 22 and 49 feet, and may be seen from sea, in fine weather, at 2 or 3 leagues off. In order to enter the port, the lights must be kept in a line; but the entrance is so very narrow that it cannot be attempted in the night without great danger, even with these new lights, unless by the aid of a pilot intimately acquainted with the passage.

ST. GILLES is a tide port, fit only for small vessels. The town is situated very low, but is known by an extensive wood near it. A tide light indicates when vessels may take the harbour. Some dangerous rocks lie about 4 miles from this place, and a league westward of the port of Ollone; they run about 2 miles into the sea, are uncovered at low water, and should not be approached nearer than 20 fathoms. Ollone is also a tide port; and may be known by one high pointed steeple and two lesser ones; but beside these, there is now a light-tower on the Kay of La Chaume, upon the western side of the entrance; and there is also a harbour light, on the head of the great jetty, upon the eastern side. The light on the jetty, in a line with that of La Chaume, gives the direction of the channel into the harbour. Both lights are fixed; that of La Chaume is 118 feet above the level of the sea, and may be seen 4 leagues off; but that of the jetty is only 23 feet high, and therefore to be seen only 1½ or 2 leagues. The coast, from hence to Pertuis Breton is very low, and the distance about 18 miles. The isle of Ré lies on the south side, distant about 8 miles.

THE ISLE DE RE′. This island is 13 miles in length, from E. S. E. to W. N. W., and is generally sterile. St. Martin, the principal place, is on the N. E. coast, and is protected by forts. At this place there is a harbour light, on the larboard side of the entrance; it is fixed 39 feet high, and may be seen at 3 leagues off. The western point of the isle de Ré is distinguished by a revolving light, of the first class, with 16 lenses: its lights are eclipsed every minute and three-quarters; they are elevated 95 feet above the sea, and may be seen 6 leagues off. From this point a great ledge of rocks, called Le Baleines, or the Whales, extends to the distance of three-quarters of a league. There are other reefs on the S. W. side which extend outward to the distance of half a league; but they diminish thence to the S. E. end of the island. On Point de l' Aiguillon, at 7 miles E. ½ N. from the port of St. Martin, there is now a fixed harbour light, at 32 feet above the sea; and which may be seen at 3 leagues off. This light bearing S. E. by E. leads directly into the mid-channel of the Pertuis Breton, between the north side of the isle Ré and the main; on advancing toward the point you haul to the southward, at a mile from shore, and may come to an anchor, with the light bearing N. E. in 3 or 4 fathoms.*

If bound from this spot into Basque Roads, or to La Rochelle, you may proceed toward the west end of the isle Ré, with the Aiguillon light bearing N. E. by N.; and will thus clear the flats, extending from the N. E. side of the island. The S. E. end of Ré is bold-to, and near it is a depth of 7 fathoms; but a shoal spit extends from the opposite side; and further south is a small rocky bank, called the Lavardin, which dries at low water; it lies about a mile and a half S. E. by E. from the S. E. end of the island. The extremities of Aiguillon point and the south point of Ré in a line, will lead clear of it on the west. Ships may round the Lavardin in good depth of water; between which and the isle de Ré are 5 and 6 fathoms.

BASQUE ROADS is a fine anchorage, with good hard bottom, carrying from 8 to 20 fathoms at low water, spring tides. It is formed by the coasts of La Vendee and Charente, to the north, east, and south, and to the westward by the islands of Oleron and Ré, on the extremities of which stand light-houses; that on the island de Ré has been already described. The Tour le Chasseron, on the north point of Oleron, exhibits a fixed light, of the first class, elevated 101 feet above the sea; and may be distinguished, in clear weather, at the distance of five leagues. The rocks which surround this end of Oleron, called the Antioche rocks, extend 2 miles to the east of the light-house; but within them there is anchorage. On sailing in, it is safest to keep over to the isle of Ré, until near the S. E. end of this island; only taking care to avoid the Lavardin, before mentioned. Then steer for the west part of the isle of Aix, a flat island, which lies about half way between Oleron and the main land. The soundings in mid-channel, between the isles of Ré and Oleron, are from 12 to 15 fathoms, shoaling toward each side. This channel, called the Pertuis d'Antioche, is nearly 2 leagues in breadth. If you enter by this channel, when bound for La Rochelle, give the isle de Ré a sufficient offing, to avoid the Lavardin, till you have a lantern tower in full view; the tower must not be brought on with the point of Chef de Baye, because this mark leads directly on the Lavardin, which lies also with the points of La Plomb and La Repentie in a line. To enter the harbour of La Rochelle and the Charente, or river of Rochefort, a pilot is indispensable.

HARBOUR LIGHTS. At 45 feet to the eastward of a lantern tower, on the north or left side of the entrance of Rochelle, there is a harbour light. It is a fixed light, at 45 feet above the sea, and may be seen at 4 leagues off. If kept open to the right of the lantern tower, it leads clear of the Lavardin. There is also a harbour light on the fort, on the south point of the isle d'Aix, which is fixed at 55 feet above the level of the sea, and seen at the distance of 3 leagues. This light, bearing S. S. E. ½ E., leads up the fairway of the Antioche passage, clear of the shoals on the N. E. of Oleron, whence you round into the road of Aix, south of the islands.

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* THE BANCHES VERTES AND ROCHE BONNE, are two reefs which must be carefully avoided by those proceeding to Basque Roads, &c. They are partly above and partly under water, nearly 2 leagues in extent S. E. and N. W., and distant about 12 leagues from the isle de Re, in latitude 46° 11′ to 46° 17′. Near them, to the westward, are 54, and to the eastward, 30 fathoms of water.

Tide. The vertical rise of tide hereabout, on the full and change, is 10 feet. The time of high water, in the passages of Breton and Antioche, is at 3h. 15m.; on the isle de Ré, 3h. 30m.; in the harbour of Rochelle, and at Brouage, S. E. of Oleron, 3h. 45m.

THE RIVER GIRONDE TO BORDEAUX. The entrance to the Gironde, or Garonne, is readily distinguished by the Tour de Cordouan, or light-house, exhibiting a revolving light, shewing alternately a brilliant, faint, and total privation of light; each change successively taking place at intervals of half a minute during the night. The Tour de Cordouan is nearly 207 feet high, and in clear weather can be seen at the distance of 9 leagues. Point de la Coubre, on the north side of the river, is low, with sand-hills rising inland. It is 2½ leagues N. ½ W. from the Tour de Cordouan. On the point is a fixed harbour light, at 36 feet above the sea, and may be seen at the distance of 3 leagues. There is a similar light at Royan, 11 miles higher up on the same side. The Point de Grave, on the south side of the entrance, has a tower of wood, exhibiting a fixed light, at 59 feet above the sea, and which may be seen 4½ leagues off.

By the recent surveys of the mouth of the Gironde, it has been found that there are now only two channels, instead of five, as formerly represented. These are the Passe du Nord, or passage by the north shore; and the Passe du Grave, or southern passage.

Passe du Nord. The entrance of Passe du Nord, between the Point de la Coubre and the banks, lies in the latitude of 45° 41′, and longitude 1° 18′. The mark for entering is, the semaphore in Terra Negre between, or nearly in a line with, the church steeples of St. Palais and Royan, bearing S. E. ⅝ E. This will lead to the distance of a mile within Coubre point, to the spot where that point bears north, and whence Coubre semaphore and north beacon are in a line, bearing N. E. ¼ E.; thus you will have passed the bar, in 4½ and 6 fathoms. Here you will have fairly entered, and should change the course to S. E. ¼ S. which may be continued for 8½ miles, until the church of St. Palais bears north, about half a league distant. From the last spot a S. S. E. course, 6½ miles, will bring you up to Mecher's road, where there is good ground of sand and mud, and from 8 to 10 fathoms at low water. Should circumstances require it, you may run up and take shelter under the point de Grave, which affords a safe retreat during westerly and S. W. winds. The mark is Royan steeple and mills N. E. ½ E. At this place, between Verdun and the bank called the Taille Fer, coasting vessels are commonly sheltered in bad weather.

Passe de Grave. This channel is 4 leagues to the southward of the Passe du Nord, and is 2½ leagues in length. Its entrance lies in latitude 45° 31′ with the Tour de Cordouan bearing N. E. one league and a half distant, and the beacon of St. Nicholas on with the semaphore of the same, bearing E. ½ S. 5½ miles. The passage has, in its shoalest part, commonly about 13 feet, but spots have been found of only 11 feet; and there is one rock of only 7 feet, lying 1700 fathoms N. W. by W. from the semaphore of St. Nicholas. It is also to be observed, that there is a flat of rock and gravel, extending N. W. from the coast of the Point de Grave to the distance of more than a mile, but on its edge is a depth of 27 feet, and no danger, unless in rough weather.

If a pilot cannot be had, you may enter the Passe de Grave, with the beacon on the sand-downs in one with the semaphore of St. Nicholas, bearing E. ½ S. as above, and may carry this mark on until the steeple of

St. Pierre de Royan (open to the right of the semaphore of that place,) comes in a line with the beacon, bearing E. N. E. The last mark kept on will lead into the main stream of the river, and at the distance of nearly a mile from the Point de Grave. Hence, you haul round the point to the eastward, according to circumstances. In going through the Channel de Grave, be cautious of advancing too near the shore, as the tide of flood sets strongly upon it; and never, if avoidable, attempt to anchor in it. No large vessel should attempt to leave the river by this channel, unless with rising tide and favourable wind.

It has been recently observed, that when the weather is hazy and there is the appearance of a calm, vessels should avoid entering the river; because, at such times, a heavy swell of the sea will frequently arise in an instant. This phenomenon is called by the pilots Le Brume Seche, or the dry fog; it is a sort of mist, accompanied by a calm, which is invariably followed by a great swell in the channels.

Tides. At the entrance of the Channel de Grave, with the Cordouan tower bearing N. E., the tides set as follows:—First of the flood, North; one-third flood, N. E.; half and two-thirds flood, E. N. E.; first ebb, S. E.; one-third ebb, South; half and two-thirds ebb, West. In the channel within, with Cordouan bearing N. N. W., the flood sets generally E. N. E.; and the ebb W. S. W. Between the great bank of the Cordouan and the point of Grave the flood sets, generally, S. E.; the ebb from West to W. S. W. The tides, both ebb and flood, set through the different channels with rapidity, and great caution is therefore requisite on making the river. Should the land marks be obscured by thick weather, or if night comes on, it will be prudent to anchor in the first convenient spot, only noticing the precautions above.

It is high water, on the full and change, northward of Cordouan, at 4h. 30m., and southward of Cordouan, at 3h. 45m. The perpendicular rise of spring tides is 14 or 15 feet, and of neaps 7 or 8 feet. The tides during the months of May, June, and even a part of July, are very small; but the Magdalen tides are often as high as those of the equinoxes, which rise 17 or 18 feet. The winds have a great influence on the tides; and, in general, you may depend on a good tide when the wind blows strongly into the river, and a lesser one may be expected with a strong wind blowing seaward.

THE BASSIN D'ARCACHON. From the Point de Grave, at the mouth of the Gironde, to the Bassin d'Arcachon, all the coast is low, sandy, and uneven. The Bassin d'Arcachon, though extensive, is too shoal for a place of much resort. Its banks block up the entrance, with the exception of two small channels, known only to the inhabitants and pilots. The breakers at the entrance may always be seen; the soundings toward them diminish gradually; and the place may be known by its low level land, destitute of trees on the north side, and the high downs appearing like little mountains on the south.

BAYONNE. From the Bassin d'Arcachon to the river Adour, or harbour of Bayonne, the distance is 22 leagues. The mouth of the harbour lies between two sandy hummocks. The bar frequently changes; the sea without is very rough; there is no entrance but at high water, and then a pilot is required.

Directions for the Bar of Bayonne. "Captains of vessels bound to Bayonne should carefully calculate the time of high water, in order to be off the bar at the proper time for entering the Adour. Their calculation should be founded on the establishment of the bar, which is at 3h. 30m. When the sea is smooth the bar will allow the passage over it at springs, of vessels drawing 14 feet, and at neaps those of 11 feet draught may pass it; provided, in both cases, that they do so at the time of high water."

"It is not always the deficiency of water on the bar of the Adour which determines the chief of the pilot station to signalize that the entrance of the river is impracticable, or at least dangerous; he is guided in his decision as much by the state of the sea on the bar, and the velocity and duration of the ebb stream. The sea is sometimes smooth outside while it is terrific on the bar, and when it would be impossible to steer a vessel in the surf on it, while even the wind may be fair for entering."

"The pilots may be sometimes deceived in their opinion respecting the state of the bar of the Adour; but whatever state it may be in, when there is nothing to prevent a vessel keeping the sea, there is no excuse for a vessel attempting to enter the river, when their experience decides on the signal being made not to do so. Even success in the attempt is scarcely enough to justify it. Captains are moreover informed, that the final signal to any class of vessels not to attempt the bar is never made, but after the result of a mature deliberation among the pilots with their chief."

Course to steer for the bar.—"Great care should be taken, when making the bar, to keep to the northward of it, whenever the wind has previously prevailed from N. N. W. to East; and to keep to the southward of it on the contrary, when the wind has prevailed for 5 or 6 days from South to W. N. W. Experience has proved, that in the first of these cases, the current sets to the S. W., and that it has carried vessels down to the coast of Spain that have not taken the above precaution."

"In the case of the wind being from South to W. N. W. the current sets to the N. E., vessels are then exposed to being drifted to the northward of the bar, when finding no shelter, and being unable to keep off the land in bad weather, they are obliged to run on shore between Bayonne and Vieux Boucant. When the wind is from N. N. W. to N. W., a vessel may run directly for the mouth of the river; and in this case, as in the preceeding, it should always be remembered that the light of Biarritz is a short league to the S. W. of the bar."

"When a ship, bound to Bayonne, meets with the wind between W. S. W. and W. N. W. on the coast of Spain, and at such a distance as precludes the hope of entering the river before dark, she should stand off and on under a press of sail, so as to counteract the effect of the current, which runs at the rate of 4 or 5 knots to the N. E. whenever the wind has been blowing some days between W. N. W. and South: she ought also to strive to keep an anchorage under her lee, into which she may run in the morning, in case of the weather obliging her to seek refuge in it. If she be certain that the current is setting her to the N. E., she should stand two hours to the northward or to the sea, and three hours to the southward or in-shore. The practice of the most experienced navigators has confirmed the importance of this mode of proceeding."

SIGNALS MADE AT THE MOUTH OF THE ADOUR. "In the signals for entering it is essentially necessary to distinguish that signifying *approach* from that of *entering*. They are made from two different stations, but with the same system of flags."

1. SIGNAL OF APPROACH.—"The signal of approach summons vessels to the bar."

2. THE SIGNAL OF ENTERING.—"The signal of entering summons vessels across the bar, and directs them how to steer so as to pass it."

"The signal of *approach* is made on the shore to the south of the entrance, on a mast 100 feet above the level of the sea at high water. That for *entering* is made at a white tower, about 50 feet high, at the head of the southern quay, about 5 ot 6 cables' length from the bar. The mast for the signal of *approach* is about a cable's length and a half from this tower."

"Ships coming to Bayonne should arrive at that distance which will enable them to distinguish the mast for the signal of approach, in order that they may conform to the signals from it, or keeping off, as hereafter stated."

Colour and signification of the Flags.—*Flags shewn at the tower.*

1. Swedish flag (blue with a yellow cross,) signifies, that vessels under 9 feet draught are to approach.

2. Flag chequered with red and white squares, that vessels drawing 9 feet and more are to approach.

3. Dutch flag (tricoloured, horizontal,) that vessels of all kinds are to approach.

"Vessels are distinguished by two divisions, to each of which a particular flag is assigned. Their coalition is indicated by the Dutch flag, which is addressed to all, large and small."

Ships to approach. "The division of vessels, the signal of which is made to approach, should make all possible sail to profit by the tide in entering. When about a quarter of a league from the bar, these vessels should observe whether their signal is made from the tower, and then they will obey successively the indications of the flag from this tower, as will be seen in the special article on passing the bar."

Ships to keep off. "If after the signal has been made for ships to approach the bar, the chief pilot considers it necessary, in consequence of of a change of weather, to make the signal for keeping off, he will hoist and lower the Dutch flag on the tower three times, after having hauled it down from the flag-staff for calling the vessels in; there will then be no signal up anywhere. When the chief pilot forbids one class of vessels only from entering, he will hoist and lower three times the flag addressed to this class, and re-hoist on the flag-staff, on the sand-hill, the Dutch flag for that class of vessels which he would have approach the bar."

"If the vessels summoned to the bar approach too near the coast, and the time for their entering the river be not come, the signal to them will be hauled down; but as the signal for keeping off is not made at the tower, this is no denial of their entering; vessels waiting for time should keep a little to seaward, under easy sail, until they are finally called to enter."

Examples in the use of the flags in different cases.—1. "The chief pilot considers that none but small vessel will be able to enter in the course of the tide. In this case the Swedish flag is hoisted on the flag-staff on the beach; small vessels may crowd on sail for the bar, where they will wait until the same flag hoisted at the tower directs them to the entrance."

2. "The chief pilot considers that the state of the sea will permit only large vessels to enter. In this case the chequered flag will be hoisted at the flag-staff on the beach, large vessels only will approach the bar; and the same flag hoisted at the tower will direct them to the entrance of the Adour."

3. "Ships of both classes may enter Bayonne—as is most generally the case. The Dutch flag, on the flag-staff on the beach there, calls all vessels over the bar. The chief pilot commences taking in the small ones at half tide, hoisting the Swedish flag at the tower. When there is sufficient water on the bar for the large ones the Swedish flag is hauled down, and the Dutch one shewn in its stead, which applies equally to vessels of both classes."

4. "The Dutch flag having called all vessels, without distinction, the chief pilot may consider it right, from motives, of which he is the best judge, to warn off the large vessels, and only to admit the small ones: in this case the Dutch flag at the flag-staff on the beach is lowered, and the Swedish flag substituted for it; at the same time the chequered flag is hoisted and lowered three times, at the tower, to warn off large ships; small vessels only then should remain, and wait till the Swedish flag is hoisted to direct them over the bar."

5. "The whole of the ships having been directed to enter by the Dutch flag, the sea may increase, so that it becomes necessary to forbid small vessels entering, in order to admit the larger ones. The signals will be the same as in the 4th example, that is, the chequered flag is substituted, at the flag-staff on the beach, for the Dutch flag; at the same time the Swedish flag will be hoisted and lowered three times, at the tower flag-staff, to warn off small vessels; large ships should look out, and remain till the chequered flag is also hoisted at the tower, to direct them over the bar."

Precautions. "As soon as one of the three flags is hoisted at the tower, the ships which it summons should make all sail possible for the bar, taking care to leave room between each other, so that no one should enter the surf until the one preceding her has passed it, and has time to pass the signal-staff and anchor. As soon as the first ship has arrived within the surf, the flag at the tower will be lowered half-mast high, and hoisted again immediately; this movement will indicate that it will be to her *that the signals from the tower will be next addressed;* when the *second ship* has also passed the bar, the flag at the tower will be lowered and re-hoisted to the third, and so on. It is recommended that captains of vessels pay the greatest attention to this signal, in order that they may not fall into serious mistakes."

"Whenever the flag of the tower is inclined to the north or to the south, the vessel entering is to put her head more to the north or south than before, and will continue to do so as long as the flag is so inclined. As soon as the flag is righted, the vessel is to keep on the course on which she may be at that instant, and will continue so, until she be signalized afresh by the same flag."

EXAMPLES.—1. "Suppose that a vessel is to the N. W. of the bar, steering S. E. to enter. If the flag of the tower be inclined to the southward, this vessel should come successively to South, S. S. W., and even S. W., in fact she should keep more and more to starboard as long as the flag remains inclined to South. As soon as the flag is righted, the vessel will keep on the course she was steering at the instant; should she be steering S. S. W. she should keep so, till signalized afresh."

2. "When a vessel ,to the S. W. of the bar is steering to the N. E. If the flag of the tower be inclined to the North, the vessel will keep more to port, as long as the flag remains so inclined, and she will, as above, keep her head on the course she may be steering when the flag is righted. Other signals from the tower will be directed to her."

THE FLAG OF THE TOWER LOWERED TO AVOID MISTAKES.—"If two vessels, one from the north and the other from the south, should offer at the same time to take the bar, as the signals to be made to them must necessarily be contrary, no signal will be made to either, in order that all fatal mistakes may be avoided. The flag of the tower will then be lowered, the two ships must haul their wind, and the signal will be rehoisted when they are at the entrance of the port, or at least when they are so situated as that all confusion will be avoided."

"When a vessel's draught of water is required to be known, approaching the bar alone or before others, the flag of the tower will be hoisted and lowered once. If the vessel draw 9 feet and under, she will answer by hoisting and lowering her flag once; if she draw 10 feet, by doing so twice; if 11, three times, and so on."

THE PASSING OF THE BAR WILL THUS BE DEFERRED OR DENIED TO A SHIP.—"After the above answer, or under any other circumstances, if the chief pilot considers it necessary to delay a ship's passing the bar that may be making for it, he will hoist and lower twice the flag of the tower; and if he denies her taking it altogether, he will hoist and lower it three times. No signal appearing at the signal-staff on the beach, it will be evident that this signal of denial will only apply to the vessel about or nearest to enter; for we have seen above that it is necessary to change or suppress the signal of approach, that the signal of denial made at the tower may apply to whole divisions."

"The bar being connected with the points forming the mouth of the river, and lying distinctly out to seaward, ships should carefully avoid keeping along the coast when near it. The mouth of the river should always be kept well open, without approaching the surf more than is actually necessary in crossing it."—*Nautical Magazine for* 1839, *page* 515.

THE RIVER ADOUR is subject to a very considerable increase of water, which increases the current of the river so much as to overpower the flood tide. Under this circumstance the current always sets out; and the outset may be known by the water of the river, which may be remarked to more than a league at sea. In this case, no attempt should be made to enter the river, because the current, running outward, increases the danger of going over the bar; nevertheless, if the wind be strong and the Dutch flag hoisted, it may be forced, but care must be taken to carry a press of sail, and to have the dead-lights in, the hatches on, and the boats, spars, &c. well secured, the sea on the bar being then very dangerous. In such a case it is necessary for a vessel to keep herself ready to enter at least an hour and a half before high water. In general the bar must be forced with all the sail the vessel can carry. If she come in with the wind right aft, the jibs must be kept hoisted, and hauled close against the stays; this precaution is indispensable, for if the sea forces the vessel from her course, they will assist her in regaining it. A vessel which, from tempestuous weather, may not be able to force the bar, should, if the wind permit, put into the port of Passage, in Spain; a coasting pilot will be sent thither by the chief pilot, with instructions to conduct her to Bayonne.

ANCHORAGE AND PORTS OF REFUGE.

PASSAGE. In bad weather vessels which cannot pass the bar of Bayonne, if the wind permits, should anchor in the excellent port of Passage, where they will be certain of finding pilots and every necessary. When captains require it, the chief pilot at the bar can send to Passage for pilots and instructions to take ships to Bayonne; with this precaution, there is never any risk in returning to the anchorage after having left.

SOCOA OR ST. JEAN DE LUZ. If there be not too much sea, vessels which cannot get into the Adour may anchor at Socoa, a little port very safe, inside the west point of St. Jean de Luz; but they should consider first their draught of water, the tides and directions, and above all should keep clear of detatched stones proceeding from the rubbish of the quays of St. Jean de Luz and Socoa. THE BAY OF ST. JEAN DE LUZ is about six cables' length deep, and nearly as many wide, from the point of St. Barbe to the fort of Socoa. Nearly in the middle of this line is the Arta, a bed of rocks on which the sea often breaks, although there are 4 fathoms on it at low water. This bank is on the line from the steeple of St. Jean de Luz to mount Eshawrre, and from the tower of the fort of Socoa to the house nearest to it. There is a passage between this danger and the fort of Socoa, about one-third the breadth of the bay at Socoa; the rocks are thus left to port in entering. It is necessary to avoid as much as possible entering before the time of half flood, although the pilot boats can go out at quarter flood, and even at low water of neap tides. The time of high water is the same as at the bar of Bayonne.

Point St. Barbe. The east point of this harbour is steep towards the sea, with a battery on it. The west point, called Socoa point, has a round tower, now a light-house, with a fortification under it, from which a pier extends S. E. a cable's length; within the latter another pier extends to the east from the shore, so that the two form a little harbour on the west side of the bay, the entrance to which has but 3 feet in it at low water. In order to accommodate vessels in this harbour, four transporting buoys have been laid down, in different situations, to which they may be attached under the regulations of the port.

Signals are made to, and for the use of vessels in the vicinity.—A fire on the mountain is a signal for vessels to keep at sea, the entrance of the port not being practicable. The display of a red flag on the same mountain directs vessels in sight not to attempt to enter till half-flood; but as soon as the red flag is lowered and a tricoloured flag is shewn at the same place, vessels may make for the land, taking particular care to observe the signals of this flag. A vessel should alter her course to port or starboard according as the flag may be inclined, and keep on that course which she may be steering when the flag is righted. When the flag on the mountain disappears, the vessel should look out for a similar flag on the north jetty, and follow the same signals from it. This flag will lead vessels to the anchorage, which a vessel may steer for, as soon as the flag is lowered, and not before, and moor with two anchors and a hawser to steady her: she should first drop her best bower for the northern anchor, and having done so, run S. W. and let go her small bower.

The signals from these flags are but seldom used, vessels generally entering with a pilot.

Marks for laying the northern anchor: bearings by compass.—Church of St. Jean de Luz, S. E. ½ S.; Chapel of Bordagain, S. S. W. ½ S.; Capstan on the north quay of Socoa, N. W. ½ W. *Marks for laying the S. W. anchor.*—Church of St. Jean de Luz, S. E. 2° E.; Chapel of Bordagain, S .S. W. ½ S.; Capstan as before, N. N. W. ½ W. In the middle of the bottom of the bay, is the small river of St. Jean de Luz, having a depth of only 4 feet at low water. This river, at a little way up, divides into two branches, on the banks of which are the towns of St. Jean de Luz and Cibouron, which are connected by a wooden bridge.

The entrance to this port may be found by means of the two mountains De la Rune and Batallera; the first bearing from Socoa point nearly S. by E. 5 miles, and the latter S. W. ¼ W. 5½ miles. Mount de la Rune is lofty and sharp pointed; and it has, or had, a hermitage on its summit; yet, when this mount bears from S. S. E. to S. S. W. it does not so appear, but presents a level ridge from the hermitage to the S. E., which seems to be still longer when it bears to the westward of S. S. W. Many ridges appear beyond this mountain, all of which are much farther up the country. Mount Batallera is high and broad; and, when viewed in the direction above mentioned, appears like a crown set round with a number of small peaks on its summit. Hence, the French commonly call it La Montagne Couronée, or the crowned mountain. When it is seen to the westward of S. S. W. (*true* South,) it loses the figure of a crown, and presents only three irregular peaks.

Those bound to St. Jean de Luz may also ascertain their situation by the remarkable land between Cape Higuera and Port Passage. This land forms a hill, which begins at the cape: it is the first high land on this shore, and is called Jaysquivel, or the shoulder of the mountain, in allusion to its being the termination of the Pyrenees on the sea.

To the northward of the bay of Bayonne there is not anchorage for a vessel in bad weather, not even in the fosse of Cape Breton. The beach of this fosse, nevertheless, in case of loss, is one on which vessels may run for a chance of saving their crews: unfortunately, to gain this in bad weather, it is absolutely necessary to run into the fosse at its entrance, about 6 miles from the coast, and indicated by two buoys, and then steer up it to the shore. To the northward or southward of the fosse are two long flats of sand, on which the sea breaks furiously, and which it is scarcely possible to pass.

In bad weather there will be less danger in remaining at anchor outside the bar than in either endeavouring to gain the fosse of Cape Breton, by running along the coast, or in endeavouring to work off. The anchorage is about half a league N. W. (by compass) from the entrance of the river, in 12 to 15 fathoms, the best position to run in from, at the first favourable moment, and where the ebb makes it favourable to make sail from, in the event of the wind allowing a vessel to get away from the land.

From Bayonne to Socoa there is no anchorage but that already described at this latter place. Vessels anchor here in 4 fathoms at low water, the bottom sand and rocks; and it is necessary to buoy the cables. The jetties of the port afford shelter from the wind; but the anchorage is very dangerous.

FONTERABIA. The bay of St. Jean de Luz, in which Socoa is situated, is sometimes inaccessible in bad weather, from the heavy sea which beats over the flats of St. Jean de Luz. The bay of Fonterabia is then the only part of the coast which can afford shelter to vessels surprised by bad weather, so as to be unable to work off shore. Small vessels are safe there, in anchoring close to the Chateau du Figuier, bearing south by compass: it is there that the fishermen of St. Jean de Luz wait, made fast to the shore, until they can return home. Large vessels anchor at 2 or 3 cables' length south of the fort, in 8 to 10 fathoms, muddy bottom, where they are safe from winds, from S. S. W. to W. N. W., but in danger with northerly ones. Navigators are especially reminded, that so soon as they get a glimpse of the shore, if they wish for a pilot, they must be careful to hoist a flag at their fore topgallant-mast head, by which they will be certain of obtaining one, according to their position, either from the port of Socoa, or from the villages of Biaritz, Guethary, to the southward of the Aar, or even from Bayonne and Capbreton, if the sea be smooth.

It is strongly recommended to captains bound to Bayonne, particularly in winter and with westerly winds, to make the land on the coast of Spain, between Cape Machichaco and San Sebastian; that, in case the weather should become tempestuous, and crossing the bar of Bayonne, which is dangerous, they may have to leeward of them either the ports of San Sebastian and Passage, in Spain, or St. Jean de Luz and Socoa, in France, from which ports they will be sure of obtaining pilots.

At 3½ miles S. W. from the mouth of the Adour is the the little port and village of Biaritz; the village is nearly a mile from the sea. On point St. Martin de Biaritz, at the distance of 2½ miles S. 33° W. from the mouth of the Adour, is a light-tower, from which a revolving light is exhibited. The flashes from it succeed each other every half minute throughout the night; and, in clear weather, they will be visible to an observer elevated 33 feet above the surface of the sea, at the distance of 8 leagues; and they will not be entirely obscured when within any distance less than 4 leagues.

Cape Higuera, the western side of the harbour of Fonterabia, lies 3 miles to the westward of Socoa point, and at the same distance to the westward of point Higuera is Turrula Point, extending a little way out from the foot of mount Jaysquivel. Here the coast is of rock, and many points stand detached from the land. Hence, to Port Passage, the shore is high and steep.

PORT PASSAGE is formed by two low rocky points that stretch out a considerable way, and thereby narrow the channel; they bear from each other nearly W. by N. and E. by S., and are distant about 92 fathoms. Within the points which form the harbour, the shores are rugged and craggy; that on the east is bordered with rocks, which, in some places, extend 15 fathoms from the land. On the opposite side the point of Cruces projects, at low water, about 6 fathoms, from a high and very steep hill, forming at the bottom a small level spot, on which people may land, but entirely covered at high water. The castle of Sta. Isabel, or St. Elizabeth, on the eastern side, is the first building seen within the harbour. The tower of St. Sebastian above it, on the opposite side, is round and high; it seems standing in the water, but is connected to a small battery on the land. The space between the castle of St. Elizabeth and this tower is the only anchorage for vessels drawing more than 10 feet water.

The hermitage of St. Anna is the second building seen on entering the harbour. It stands on the eastern side, at a quarter of a mile above the castle of St. Elizabeth, and serves as a mark for avoiding the western shoal that lies without the entrance. This shoal is a sharp pointed rock, having on its summit but 2½ fathoms of water, but close to it is a depth of 5 or 6 fathoms. The rock lies, with the hermitage of St. Anna, hidden by the spot of point Cruces, on which the cross is erected. The eastern bank, without the harbour, is a rocky bar, 41 fathoms in length, and having only one fathom over it; but between it and the land are from 4 to 7 fathoms, and on its north side, very close to it, are 11 and 12 fathoms. All that is requisite, in order to keep clear of it, is not to run within two-thirds of a cable's length of the east shore of the harbour.

In entering the harbour, when at the distance of 2 or 3 cables' length from the mouth of it, bring the hermitage of St. Anna, with the rocks at its base, open with the iron cross on point Cruces; or, bring the extremity of point Cruces in a line with the salient angle on the western side of St. Elizabeth's castle; then stand on, with these marks, in mid-channel, until you are half way between the little point of Arando and point Cruces. From this spot stand more to the eastward, in order to keep clear of the rocky shoal about that point, until the tower of St. Sebastian appears between St. Elizabeth's castle and the point. Now steer for the tower, which will lead, through the deepest water, to point Cruces, whence you turn towards the castle of St Elizabeth. Having passed the castle of St. Elizabeth you may bring to, in 3½ or 4 fathoms, with an anchor from the stern; then make fast cables to the shore, on both sides, in rocks bored through for that purpose. At high water there will be room to turn the vessel round, and to moor with four good cables out, N. E. and S. W., and

N. W. and S. E. especially in winter, on account of the strong run of the sea, and the whirling gusts of wind which come down through the breaks in the hills into and about the harbour. The time of high water in the port, is 3h. Common spring tides rise 12 feet; neap tides, 8 to 10 feet; equinoctial spring tides, 15 feet.

GENERAL REMARKS:—1. A large vessel may take PORT PASSAGE, with the wind from W. N. W. by the North, to E. N. E., when the tide is growing, and the sea not very rough. Other winds are apt to take the vessel ahead in the windings in the harbour, which is too narrow to admit of tacking; but when these winds are very easy, vessels can anchor at the entrance, and may be warped in or towed by the country boats. The most adverse wind is from the west; for as, from the mouth as far as point Cruces, it draws away a little to the N. W., it promises an easy entrance; but from this point inwards, it comes away from the S. W. squally and uneven, so as neither to allow a vessel to go in, nor to turn back to the mouth, nor even to come to anchor, because this is the narrowest part of the harbour; so that such circumstances render an advance dangerous.

2. The tide ought to be growing, for the wind commonly dies away between point Cruces and St. Elizabeth's castle; but the tide, added to the ship's way, soon carries her beyond that spot; and, with regard to the steerage, it is taken for granted that she has boats, both ahead and astern, to assist in case of danger. Should she touch the ground anywhere the tide probably may lift her off.

3. If the sea without be not moderate, the water is so rough within the harbour as to disturb the steering of any vessel, and she may, in a few seconds, be on shore.

4. At this and the other harbours hereabout, the activity of the native seamen alleviate the dangers very considerably; being ready with their boats in piloting and towing vessels into them. Those of Port Passage and the neighbouring harbour of St. Sebastian have peculiar encouragement, by a regulation, which ordains that the boat which first reaches the vessel must be employed, and each man in her paid 12 reals of Vellon, or 2s. 6d. sterling. The other boats may either be employed or not, at the option of the master, and each man employed can demand only 9 reals, or 1s. 10½d. Both men and boats are well qualified for towing, warping, mooring, or keeping a vessel of any size in her proper course.

5. In thick or hazy weather, when the people in the vigias or look-outs, on land, are unable to discover vessels, on firing a few shots, the boats stand off to sea, but not beyond soundings. In stormy weather, when they cannot venture off, the people repair to the mouth of the harbour, to make fast cables on shore, and do every thing else in their power, to assist vessels approaching.

At the distance of 5 leagues from Port Passage, the depth, without, varies from 100 to 120 fathoms; and at one league, from 25 to 30 fathoms; in some places rock, in others sand. The prevailing winds hereabout are, in winter, from the S. W. and N. W. quarters, in general with rain; in summer, gales from E. and N. E., with clear open weather, are frequent. The currents generally follow the direction of the wind. If a vessel, bound for Port Passage, should find the wind blowing hard from west, the safest way will be not to attempt this harbour, but to run, if possible, into that of St. Sebastian, and stay there until the wind or weather changes. Or, if more to the westward, she may be sheltered on the east side of Atalaya, or Look-out Point of Guetaria, 7½ miles from St. Sebastian, as the anchoroge there is safe and easily taken.

ST. SEBASTIAN. To the westward of Port Passage is the high and steep point of Atalaya, with a shoal at two cables' length from it, on which the sea breaks, when there is even but little swell. There is a passage between the shoal and the land, through which a vessel may venture in case of necessity. The northern point of Mont Orgullo, or the high land of St. Sebastian, is a mile and a half from point Atalaya, and exhibits, on its summit, the large castle of La Mota. Within the hill, to the S. E., is the fortified town of St. Sebastian. The light-house stands on Mont Igueldo, at the distance of a mile to the westward of the castle of La Mota. The island of St. Clara, which is somewhat rugged and of moderate height, lies between, and has a chapel on it. La Bancha is a rocky shoal lying off the isle of St. Clara; its shoalest water is 3 fathoms, and, with a swell, the sea breaks on it. The passage in, between Mont Orgullo and the isle of St. Clara, is clear. It has nearly 9 fathoms in mid-channel, but only two on each side. The harbours may be readily found, by the castle of La Mota and the light-house, both of which may be seen in clear weather, at the distance of 10 or 12 leagues. The light-house is white, and, by night, exhibits a fixed light, which may be seen 7 or 8 leagues off.

To enter the Bay. Keeping clear of La Bancha, bring St. Bartholomew's church (which stands in the bottom of the bay) in a line with Mont Ordaburo (which stands inland, having two peaks on its summit) and bearing S. by E. ½ E. By following this direction, until the town of Guetaria be hidden by the northernmost part of Mont Igueldo, you will be within the shoal, and may make for that anchorage in the bay, which seems most convenient. The common anchorage for large vessels, is about a cable's length to the south-eastward from St. Clara's island, but it will admit only two at a time, in from 4½ to 5 fathoms, mooring with four anchors N. E. and S. W., and N. W. and S. E., as, from the small extent of deep water, there is not room for them to swing round. All the cables and anchors should be good, because those to the N. E. and N. W. have to resist the heavy sea setting in, when the wind is to N. W., and those to the S. E. and S. W. have to resist the efflux of water out of the bay: cables may also be made fast to the rocks of the island, taking care to serve them well to the length of 30 fathoms, as the bottom is rocky close round the island; at a greater distance the ground is clear and good. Small vessels may come-to on the south side of the island, in 2½ and 3 fathoms.

For the protection of vessels trading with the town, there are piers, within which vessels of 300 tons may enter at high water; but, when the tide is out, they lie dry on a hard bottom. In a gale from the N. W. it is very hazardous to run for the piers; for the vessel must come-to opposite the outer one, perfectly exposed, and at high water precisely, when some of the shore boats must be employed to convey a cable to the ship, by which the people on the pier heave her within the heads.

From Mont Igueldo to the river Orrio, an extent of 5 miles, the coast is high and precipitous, and from two small projecting points are some detached rocks, with ground which appears of a whitish colour, and hence the second point is called Tierra Blanca. The latter is at the foot of Mont Agudo, which serves as a mark for the coast. The mouth of the river Orrio lies between high land on each side, and on its bar is a depth of only one foot, at low water. From the river Orrio to point Mairuari, distant one mile, an islet lies off the point surrounded with reefs.

About 7½ miles to the westward, from the light-house of St. Sebastian, is the Atalaya, or Lookout Point, of Guetaria. It is the north point of the island of St. Antonio, which has a chapel on its top. The island is rather elevated, and joined to the main by a pier, so as to afford a safe harbour for small vessels; but those of a larger class may anchor securely on the east side of the pier, in 8 or 10 fathoms, being well protected from all winds from the S. W. to N. N. W., but is entirely open to other winds. This road may be readily known, when near the land, by the island; but, at a distance, the island is not distinguishable from the main land. In a state of uncertainty, if the flat shore of Sarans be made, this will be a certain guide.

St. Nicholas' Island is joined to the main land by a neck of sand, uncovered at low water. It is an islet of middling height, with a hermitage and battery on it. Within it is the little haven of Lequeitio, which admits fishing and other small vessels. More than a mile from this is the hermitage of St. Catherine, with a watch-tower, on a projecting point of moderate elevation, perpendicular towards the sea, and of a black colour; the singularity of which marks this part of the coast, as well as the height of Lequeitio, which stands at the distance of a mile from the hermitage. The Point of Hea, low and rocky, with some large rocks about it, is a mile and two-thirds from St. Catherine's point. Cape Ogouno, which is high, of a red colour, and perpendicular, is 5⅓ miles from the same point. This cape is an excellent land-mark, there being no other like it on the coast. The Isle of Isaro, surrounded with shoals and rocks, lies 2 miles from Cape Ogouno; between it and the main is a passage of 12 fathoms. Within this island is the mouth of the river of Mondaca, impeded by a shallow bar. The harbour of Bermeo, a small creek, lies one mile and a quarter from Isaro.

CAPE MACHICHACO is 3½ miles from the isle of Isaro. It is not very high, but steep, and has a number of rocks about its base; at about half-way up the slope is a sudden break, visible in every direction between W. S. W. southward, to E. S. E. (by compass); by this break the cape is distinguishable from other mountains of the neighbourhood. At two-thirds of a mile to the west of Cape Machichaco is Aquech islet, high, broad, and steep, but clear to seaward; and, at a mile and a quarter from the same cape, is another, joined to the land by a bridge, and having a chapel; behind this the land is high and rugged. Cape Villano is 6½ miles from Machichaco. It is high, broad, and precipitous, and midway, between, is a sharp pointed hill, called the Alto of Pleusia, which serves to point out the situation of the two capes. About half a mile westward from Cape Villano is a small low islet, close to the land; the point of land near the S. W. side of it is less elevated than the coast to the eastward, but equally steep and precipitous. Nearly a mile to the southward from this point, is the entrance of the River of Pleusia, open to the N. W., and formed by two rugged points, of a reddish colour, but impeded by a shallow bar, which frequently changes.

BILBOA. The entrance of the bay of Bilboa lies between point Galea and point Luzuero, its western boundary; distant from each other three miles, W. by N. and E. by S. When coming from the eastward Bilboa may be easily known by the white appearance of Galea point, and the wide opening of the bay; and these marks, together with the sharp-pointed hills of Luzuero, Serante, and the south peak, will soon point it out to the mariner, from the westward. The red point of St. Ignacio lies half a mile within Galea point; it has several rocks lying off it, one of which appears like a buoy, when seen at low water, and is called the Pilot's rock. Between this and tho point and battery of Begona, further on, is the town of Argota, having a small pier.

The entrance to the river of Bilboa is formed by two piers that run from the bar to the town. On the west side, at a quarter of a mile within the piers, is the town of PORTUGALETTE off which, is the best anchorage in the harbour; old guns are fixed in the ground, on the quays, to which the cables may be fastened. On the outer bar, off Santurce, which is changeable, there is a depth of about 4 feet, at low water. The chief and other pilots employed on the bar and river reside at Santurce. In winter a heavy sea sets into the bay, which, at times, renders it impossible for the pilots to go off.

If a vessel, from the offing, be driven in by stress of weather, when the pilot cannot go off, he places himself in one of the batteries to the N. W. of Santurce, and makes signals with a red flag, so as to direct her to starboard or larboard, for the deepest water. If coming in, when the tide does not serve for taking the bar with an unfavourable wind, you may come-to in the bay, midway between the outer points Luzuero and Galea, bringing the latter in a line with Cape Villano, in 16 fathoms, with sandy bottom. There is here sufficient room, in case a heavy on-shore wind should bring home the anchor, or part the cable, to let go a second anchor, before the ship can get ashore. In summer you may lie nearer to the land, in from 10 to 12 fathoms, all the bottom being of sand.

DIRECTIONS FOR ENTERING THE PORT OF BILBOA, OR RIVER NERVIOU, *by Mr. Henry Thompson, second Master of H. M. brig Saracen.* "The entrance of the river Nerviou is situated in latitude 43° 20′ N., longitude 2° 53′ W. It is high water on the bar, at full and change, at 3h., P. M., and at Bilboa, at 3h. 20m., P. M. Spring tides rise 13 feet; and the variation of the compass in July, 1836, was 23° W. Vessels bound to this river, in fine weather, will generally find pilots a short distance from the land, as many of the fishermen, living in the vicinity of the river, are pilots."

"In standing toward the bar, at the entrance of the river, the chief pilot will always be found in attendance, in a boat, which may be known from others by having a red flag flying, which boat is to be kept in a line with the western pier head, as the leading mark over the bar. The bar is sounded daily by this pilot (when the wind and weather will permit), otherwise it cannot be depended upon, in consequence of the sands of which it is composed, frequently shifting. But, in bad weather, when boats cannot go out, on the appearance of any vessel standing into the bay, if the bar is considered passable, a red flag is hoisted on a point of land about half a mile outside Santurce, a small village on the western extremity of the bar; and, in this case, the chief pilot stations himself on the western pier head, with a red flag in his hand, with which he guides vessels across the bar, waving it to starboard or port, as necessary, (on the flag being waved to starboard, it is meant that the vessel's head is to go to starboard—of course, the helm to port). If the bar is not passable a white flag is hoisted on the same point of land, and kept flying during the time any vessel is seen in the offing. In this case I would recommend, during the winter months, for any vessel to proceed for Santona, a port about 17 miles to the westward, and there await for moderate weather. The state of the bar is generally known by the pilots of that port, and the anchorage there is also good."

"During the summer months, I would recommend vessels to stand off and on, keeping outside the bay, and well to the westward, to avoid being driven on Cape Villano by the N. W. swell, which is a common occurrence when the winds fail. Anchoring in the bay is not recommended under any circumstances, except for a few hours during the day to await a tide, as the riding is very heavy; and, should a vessel part her cables, it would be almost impossible to work out against the heavy north-west swell. It is impossible to lay down marks for taking vessels up and down the river, its navigation being very intricate, owing to the irregularity of the shoals."

"Between Portugalette and Olaveaga there are several muddy flats stretching out from the sides of the river, with only 8 feet at the deepest part, at low water; and between Olaveaga and Bilboa, there are similar shoals extending the whole way across the river, and are barely covered at low water, spring tides. The river is navigable at high water, spring tides, for vessels drawing 9 feet water, as far as Bilboa; those drawing 12 feet to Olaveaga; those drawing 15 feet may lie at Saroza, San Nicholas, and Portugalette."

"The general mark for crossing the bar, for boats and small vessels, (say, those drawing 8 feet) is to bring the churches of Portugalette and Sestao in one, standing on with this mark until having arrived half way between the point of land, El Campello, (is the one on which the red and white flags are hoisted, to show the state of the bar,) and the village of Santurce; the western pier, at the entrance of the river, will then be end on, which is the leading mark over the bar; and, when abreast of the house called Casa de Campo Grande, which stands alone, about one-third the distance from Santurce toward the pier head, haul over for the middle of the river, to avoid a ridge of loose stones, extending a little more than a cable's length from, and in a line with, the western pier head, with only 4 feet over it, at low water: there is a similar ridge stretching out, about two cables' length, from the eastern pier head, dry at low water, which will also be avoided by following the above directions. Steer midway between the two piers, until abreast of Portugalette, at which place there is a good anchorage in the middle of the river, as far up as the bridge, called Las Siete Ojos, or the Seven Eyes, it having seven arches."

"After crossing the bar, and being between the two piers, which form the entrance of the river, (if boats have not been able to go out) a pilot will be found in readiness to go on board to bring the vessel to an anchor, or, if the wind and tide will permit, to proceed direct up the river. Should the wind prove otherwise, bullocks are provided by the pilots, for the purpose of towing vessels up and down the river, there being a good stone pier, on the left hand side, all the way to Bilboa. The largest vessels the pilots will take over the bar are those not drawing more than 15 feet water, but, in this case, it must be with a smooth sea on the bar, and a commanding breeze, at the top of high water, spring tides. The pilots generally dislike taking in such large vessels, as the bar is very dangerous, and cannot always be depended on."

The town of Santurce is small, lying on the west side of the bay, and has a pier and harbour fit for small craft; from hence to point Scoallo the distance is 3 miles, in a N. W. by N. direction; the mountain of Serantes lying between, and the land in general being high and rocky. The point, and a sharp topped hill, of Luzuero lies about half a mile further on, in the same direction. Two remarkable mountains, called Corredo and Candina, lie between this and mount Santona, which is distant 14 miles. The coast is likewise indented by several small bays or inlets, only fit for coasting vessels.

SANTONA. This port is bounded by a high steep mountain of the same name, on the starboard side, and point Rastrellar, also high, black, and rugged, on the opposite. The latter point has several rocks under it, and some shoals on its western and southern sides. A bank, called the Doncel, lies at about one-third over from the hill of Santona, which may be considered as the bar; it has 2 or 3 fathoms over it at low water. To the westward of this, at the mouth of the harbour, is a sand bank, called El

Pitorro, extending westwardly to the length of 3½ cables. Between this bank and the hill the channel is only two cables' length in breadth, with a depth of 4½ to 7 fathoms.

To sail into this port you should keep within a short distance of point Frayle, a strange peaked eminence, being part of Santona hill; and take care to steer clear of Merano shoal, that lies N. E. by E. two cables' length from the point. You may then run along shore, at the same distance, until Carlos battery, on its south point, come in one with the convent of St. Francis de Ano; this is on the west side of the harbour: keep this mark on until you have passed the bar, or until you come near to the Carlos battery, then haul to the S. W. towards the steeple of Cicero, by which the shallows of Carlos battery will be avoided; but take care not to proceed too far to the S. W., lest you touch on the Pittoro. You will now see St. Martin's battery, which is on the S. W. side of the hill of Santona, then keep in mid-channel for the town of Santona, and anchor in 6 to 8 fathoms, sand and mud, mooring either E. or W. according to the set of the tides. A vessel may anchor S. S. E. or S. W. by S. from point Frayle, by bringing St. Carlos' castle in one with the church of St. Francis de Ano; but, in gales from the eastward of north, it is neither safe to run from here into the harbour, or weather Sonavia Point.

SANTANDER. The course from port Santona to Cape Quego is N. W. by N. This cape is of a red colour, rugged, though not lofty, with a house on it that serves for a watch-tower. N. W. by W. westerly is Cape Ago, and westerly from the latter is Cape Quintres, somewhat higher and having a white appearance. You then pass the capes of Galisano and Langre, and will perceive the island of Santa Marina, which forms the eastern point of the port of Santander. The western point is named Cape Mayor, moderately high and steep, with a watch tower on its summit; S. S. E. ½ E. 1¾ miles from which lies the island of Mouro, having a large rock on its eastern side, and a shoal of only 2 fathoms N. N. W. a cable's length from it. Two channels thus lead to the harbour of Santander, one between the islands of Santa Marina and Mouro, and the other between the latter and Port Point, named the bar, though having not less than 6 fathoms within it, and equally good with the other. Cape Menor lies S. S E. from Cape Mayor, and ends in a low flat point, having a reef of rocks running from it; and, S. ½ E. 1½ mile is Port Point, generally considered the inner or harbour point. The coast between bends circularly to the westward, forming an open roadstead to wait for the tide serving to enter the harbour, anchoring with Capes Menor and Mayor in a line, in 10 to 12 fathoms, sandy bottom. Three batteries are here erected, and another, called the castle of Ano, stands a little from the harbour's point.

Should it blow from the N. W. or S. W., and a heavy sea arising, it is extremely difficult to gain the harbour; in that case it will be more prudent to drift with the tide for the roadstead of Promonterio, and there wait for a change of wind; or, with an ebb tide, it may be safer to run for the roadstead of Sardinero, the northern shore of the harbour, from Cerda battery to the point of Promonterio. Should it blow from the N. E. or S. W. you may enter by the channel between the islands of St. Marina and Mouro, or by that between Mouro and point Puerto, as both channels are clear and good. Having passed the point you will see a perforated rock, called La Oradada, which stands at the distance of 3 cables' length to the eastward of it. This islet is clear on its south side, and is to be left on the starboard side; but, having passed it, you must have a pilot for proceeding up the harbour. Here, with a southerly wind, which blows very hard in winter, the anchors frequently come home. High water, on the full and change, at 3h. Spring tides rise 13 feet, neap tides 9 or 10 feet, and more when the wind is from the N. W. The stream of ebb is stronger than that of flood, and runs at the rate of 3 miles an hour. Within St. Marina's island a branch of it sets to the S. E. towards the sand to the southward of that island; this is deserving of notice, because many vessels have suffered from ignorance of the fact.

About a mile to the westward of Cape Mayor is Cape Lata, which is rather lower and rocky; and hence to PORT ST. PEDRO the coast continues rocky, but declines in height: this is a little shallow bay, used by fishing boats in north-easterly winds. An irregular coast trends hence to the watch-tower of St. Juan, and thence to the point of Somocuevas, with many rocks close to the land. The point of Suarces, which is low, may be known from the little island which lies off it. The point and watch-tower of St. Justa lies rather more than a mile to the westward of this island; and at 2½ miles from the point of St. Justa is that of Calderon. Here the coast is steep and level, and forms a small bight, studded with rocks. From Calderon point the coast trends to the southward of west, nearly 4 miles to the west point of St. Vincente de Luano, on which is a hermitage. Three miles hence, to the westward, is the east point of the opening of Cumillas, high and level on the summit, but perpendicular towards the sea, having a reef before it. At 1¼ mile west from this point is the west of Cumillas, on the S. E. side of which is a rocky islet, having, on the land side, a pier for small craft, which lie dry at low water. The eastern point of Cape Hoyhambre lies N. W. ¾ W., two miles from the west point of Cumillas. It presents, to the north, a face of one mile in length, of moderate height, but steep, and of a white colour; it is bordered with a shoal to the extent of a cable's length outward.

ST. VINCENTE DE LA BARQUERA. This harbour lies to the southwestward of Cape Hoyhambre, and can receive such vessels only as do not draw more than 12 feet water. The isle del Callo marks the west side of the entrance; and has a small channel within it, but it is shoal. The harbour is too dangerous to be attempted, at any time, without a pilot. Between this harbour and Cape de Mar the coast is variegated, but affords no shelter for a stranger. CAPE DE MAR is of moderate height, perpendicular, and free from rocks; on its top is a hermitage. At 5 miles to the westward is Cape Prieto, having a watch-tower on its summit; it is of middling height, and surrounded with rocks. The land between the two capes is nearly of the same height, and along shore may be found a large rock under Cape Prieto, the islet Desuracado, and the cove of Carneros.

THE RIVA DE CELLA lies 7½ miles N. W. by W. ½ W. from Cape de Mar. The harbour is obstructed by a bar of sand, having only 5 feet over it at low water. Off the eastern point lies the Sarrapio reef, on which the sea breaks when there is a swell, although there seems to be a good depth over it. Two miles to the westward of Riva de Cella is the point of Carreros, which is low, and so surrounded with rocks as to require a berth of one mile, at least from vessels when passing. Misiera point, having a battery, is nearly 7 miles from that of Carreros, but there is between them no place of shelter, with the exception of the little cove of Lastries, which has clean and good holding ground. Cape Lastries is about 1½ mile from point Misiera, it is high and abrupt, of a red colour, and has a ledge of rocks without it. About 4 miles N. W. ¾ W. from Cape Lastries is Tazones point, on the east of which is the river Vella Viciosa, capable of receiving vessels drawing 12 feet, but at high water only; in the middle of its entrance there is a rock, and none should venture without a pilot. Between Tazones point and Cape St. Lorenzo, an extent of 10 miles, there are only a few creeks and rivulets. About 2 miles from Cape St. Lorenzo is St. Catherine's point, with its chapel; the outer part is steep, and on the slope, inland, stands the town of Gijon. Beyond this point, at rather more than two miles, is Cape Torres, with an inlet at its base, named Orrio.

GIJON. This bay, or road, lies between St. Catherine's point and Cape Torres, and affords good anchorage in easy weather, but is open to the N. and N. E. Should a large ship, in summer, have occasion to let go an anchor here, it must be with the islet Orrio, off Cape Torres, in a line with the town of Candas, lying 3½ miles to the N. W. of it, and in 11 fathoms, dark sand. Even here, care must be taken to be ready to get under sail, in case the wind should change to blow on shore, which is frequently the case, even in summer, and the sea is then so heavy as to render it almost impossible to get out of the bay. These heavy on-shore winds commonly last two or three days, and that from N. E. is most prevalent. Small vessels may take the pier of Gijon, but they must be conducted by a pilot. On the bar are 9 feet at low water. The vessels within the pier lie dry at low water.

From Cape Torres to Cape Penas the coast is foul and dangerous. At Luanco is a small cove and pier, only fit for small vessels. Off the point of the same name is a rocky islet, called La Baca de Luanco. Cape Penas, on the north, presents a broad steep head, of nearly one mile in extent. Its summit is level, and it appears of a whitish colour. The foul ground about this cape are very extensive, and large ships should never approach it within the distance of 4 miles. The coast continues foul to the S. W. of Cape Vidio, an extent of 20 miles, and in no part does it afford shelter for a stranger. Cape Busto, which is high and steep, is 9½ miles W. by N. from Cape Vidio; a ledge of rocks extend from it to the N. W.; and E. from it, at the distance of seven-tenths of a mile, is Serron islet, in shape like a pyramid, and, therefore, serves as a mark for the cape. Between these capes the coast generally is rugged, and bordered with islets and rocks, some above and many under water. From Cape Busto, westward, the shore continues foul to the river Navia, a distance of nearly 4 leagues. From this river the coast continues very rugged, like that to the eastward, to the islet called Orrio de Tapia. From this islet to Point Rumeles, the eastern point of the harbour of Rivadeo, the bearing and distance are W. ½ N. 3¾ miles; in this track are some inaccessible coves, the Pantorgas rocks, and the Moulas shoal.

RIVADEO. This harbour may be readily found by the mountains of Mondego and St. Marks, which appear to the east; the first is very high, having on its top some white rocks, which, at a distance, appear like buildings; St. Mark's is low and round, having an hermitage upon it. Vessels, drawing 16 to 18 feet water, must run up mid-channel, until Point Castrellias be open to the southward of its islets and rocks, whence they make over to the western shore, and anchor opposite to Damian castle, or a little to the southward of it, in 5 fathoms, sandy bottom. As the channel is here narrowed by the bar, which extends to the N. E., they should moor with four anchors, head and stern, as even the south wind, at times, blows here with great violence.

From the entrance of Rivadeo, at the distance of 20 miles, N. W. ¼ N. (by compass) lie the Farallone rocks of St. Cyprian, between which and the shore is a passage of 13 or 14 fathoms, sandy bottom. In the tract of coast between are some small rivers, but they are hardly accessible, even for small craft, at high water; before the last of these rivers is Suela islet, which affords shelter in winds from W. N. W. to E. N. E., and sufficient room for a large vessel, in case of necessity, in from 3 to 4 fathoms, sand and good holding ground. From the northernmost Farallone, distant $3\frac{1}{10}$ miles, N. W. $\frac{3}{4}$ W., lies point Roncadoira; and midway between is Portizuelo river, at the foot of Monsancho mount, which is very sharp on the top, and which, with the islet Anseron, is a good mark for the shore. W. by N. $1\frac{1}{2}$ mile from point Roncadoira is Sainas point; and, at 2 miles W. S. W. $\frac{1}{4}$ W. from the latter, is the point of Faro, appearing beneath a hill of the same name, on which is a watch-tower.

PORT VIVERO lies between the points of Faro and Socastro; it is clear and deep, and a ship may tack in it with safety, but it is open to the north. The best anchorage is with the east side of Queimada isle on with the S. E. side of Gaviera isle, and Puntal point in a line with the southernmost houses of Sillero; here is a depth of 5 fathoms, clayey mud. The ship should lie east and west, that the cables may have an equal strain in southerly winds, which, in summer, blow hard, and also in the heavy sea which frequently sets in from the N. and N. W. It is necessary to weigh the anchors, from time to time, because, if they remain long in the ground, they will not be raised without difficulty; if they be not totally lost.

Inlet of Vares. From the Point of Socastro, at the distance of two miles, N. $\frac{3}{4}$ W. is Point Ventosa; and $2\frac{1}{3}$ miles from the latter, N. by W. $\frac{1}{4}$ W., is Cape Vares, which is high and steep. Between is the inlet of Vares, very clean and deep, excepting close to the land. The harbour is open to winds from the N. E., when the sea is very troublesome, but it affords shelter from those in the S. E., S. W., and N. W. quarters. To vessels falling to leeward of Cape Ortegal, in hard weather, this place may afford convenient shelter; the bottom is of sand, and the ground is excellent for holding. The fishing boats of the town will readily afford assistance, and water and provisions may be obtained here.

Point Estaca is the northernmost point of the Coast of Spain, distant $1\frac{3}{5}$ miles from Cape Vares. At $6\frac{4}{5}$ miles W. N. W. $\frac{3}{4}$ W. from Point Estaca is the Cape of the Aguillons, which is high and steep; a cluster of islets lie to the northward of it, and leave a narrow channel between them and the land. The bay of Santa Marta, lying between Point Estaca and Aguillon, affords no place of shelter for shipping.

CAPE ORTEGAL is high and precipitous, with a shoal lying N. by E. from it, distant half a mile. A good mark for distinguishing it from seaward is a watch-tower on the highest land, at a mile and two-thirds from the cape to the southward. At the distance of 7 miles W. $\frac{1}{2}$ S. from Cape Ortegal is Candelaria point, having a watch-tower near it. All the coast between is steep and rugged. Point Pantin, the west point of the little harbour of Cedeira, is 3 miles S. W. $\frac{3}{4}$ W. from Point Candelaria. A ledge of rocks extends to the northward from Point Pantin; and Tofino says, that "from the information of the fishermen, a shoal lies N. 22° E. *(true)* one mile and a half from the point, with only 3 fathoms over it."

Cedeira. This harbour, though small, has good holding ground, but open to the N. W., and adapted only to small vessels. On entering from the north-westward, Point Pantin must be passed at the distance of a cable and a half's length, so as to clear the White rocks. Hence you advance to Serridal point, and along shore to abreast of Solvieras point. Within the latter, anchor with the flag-staff of the castle in a line with Point Pantin; here there are from $2\frac{1}{2}$ to 3 fathoms, sand. Vessels commonly moor north and south. W. S. W. $\frac{3}{4}$ W. from Point Pantin, distant $5\frac{3}{10}$ miles, is the Point of Frousciras; and 6 miles W. $\frac{3}{4}$ S. from the latter is Cape Prior, which is nearly a mile and a quarter in extent, and bordered with rocks on the eastern side, to the distance of 1½ cables. Between the two capes the only remarkable object is Mount Campelo, near the shore, which has a sharp summit, with a watch-tower on it.

Cape Prior may be well known by a low sandy beach to the eastward, and another to the southward; these appear to join each other, making the cape look like an island; and it may be here proper to remark, that several rocks lie between Cape Ortegal and Cape Prior, over which the sea breaks with a swell; the current sets in to the land, and, with light winds, it requires great vigilance to prevent being embayed, or driven on shore; but large ships, with a good steady breeze, may pass on even within two miles of Cape Ortegal. All along this coast the tides rise about 15 feet, and it is high water about 3 o'clock, on full and change. About one league to the southward of Cape Prior are two large rocks, called Gabeiras, high, steep, and separated from the land, having, it is said, a passage for boats between. Cape Priorino is 2¾ miles to the southward from the Gabeiras; it is not so lofty as Cape Prior, but more clear at its base, and has a shoal close to the land on its south side. Behind the cape is Mount Ventosa, having a watch-tower on its summit. From Cape Priorino the coast to the S. E. forms a slender bay to Little Cape Priorino, which has a broad appearance, and is considered a good distinguishing mark for the entrance to Ferrol.

FERROL. To the southward is Point Segano, high and steep, having upon it a battery and watch-tower. Near its point is a sunken rock, called La Mucla, covered with weeds, and having only one fathom over it at low water. Between this rock and point is a depth of 4½ fathoms, and the passage may be used, in case of necessity, by a small vessel. On the north side is Point St. Carlos, which forms the narrow entrance into the harbour: it is only one quarter of a mile in breadth. St. Philip's castle is three-quarters of a mile within that of St. Carlos, on the same side; its walls are washed by the sea. The south side of the Narrows is protected by the castle of St. Martin, situate on a point which reduces the channel here to one-fifth of a mile. At half a mile within this is the castle of Palmas, and next is Point Rodondo, where the coast forms an inlet called Bano cove.

Ships bound in, with an adverse wind, if it be not very strong, may, by a few tacks, gain the bay of Carino, between Little Cape Priorino and St. Carlos point. Here they may come-to, in from 14 to 8 fathoms, sand, and be sheltered from winds at N. W., N., and N. E. Be ready, however, to take advantage of the first breeze from S. W. to gain the harbour, as the winds in this direction are the most dangerous hereabout. Should the wind prevent your turning into this bay, the only resource is to run for Corunna, and there await more favourable winds, &c.

The winds for entering the harbour are those from between S. W. by W. to N., by compass. With these you may pass to the southward of Cape Priorino, at the distance of half a mile, or less, if required. Hence run up in mid-channel, keeping over rather to the north or south shore, according to the wind, and observing that, from St. Philip's castle, a small ledge of sunken rocks extends about 30 fathoms to the southward, over which there is, at low water, only 2 and 2½ fathoms; and, from Palmas castle there is a similar one, stretching out to about the same distance. From Point Redonda a reef also extends about 40 fathoms to the N. E., with 1 to 2½ fathoms over it; and there is a sunken rock just without Bispon point. With the wind large there will be found no difficulty in keeping clear of these dangers. Having passed the Narrows, you may come to an anchor wherever most convenient. It is usual to moor N. E. and S. W., so that with the wind at S. W. you first let go the anchor to the larboard, or the contrary, according to circumstances. There is rocky ground about the length of a boat, lying directly in the fairway between the Mole of Ferrol and Seixo point, on the opposite side. A leading mark to clear them on the south, is Bispon point in a line with the bottom of St. Philip's bay.

With equinoctial gales the tides run in strong, at which times it is always advisable to go in or come out of the harbour, one hour before either high or low water, that you may head the current; this is more requisite when many ships are passing, but otherwise you may wait until the turn of tide. In these gales the tides rise nearly 15 feet, being nearly 2 feet more than they do at ordinary spring tides, S. S. E. $\frac{3}{4}$ E. from Little Cape Priorino is Point Coitelada, and S. S. W. at the distance of 3 miles from the same cape is La Marola Rock.

Between these points forms the entrance of the bays of Ares and Betanzos, which presents nothing remarkable that may not be understood on reference to the chart. The coasts, in general, are rocky and precipitous. Seixo Blanco Point, on the N. E. side of the bay of Corunna, is high and steep, and is visible at a great distance, appearing like a roadway down to the water. The coast, eastward, hence to Torella Point, is equally high and steep. All vessels approaching the coast hereabout must be very cautious in running for shelter into the bays of Ares and Betanzos, being entirely open to the winds and sea; and it is to be remembered that south winds are here extremely dangerous.

CORUNNA. The tower of Hercules, or light-house of Corunna, bears S. W. $\frac{3}{4}$ W., $5\frac{1}{2}$ miles from Cape Priorino. The light, having reflectors on the opposite sides of a circle, is revolving, and so contrived that the intervals of light and shade are of equal duration. It may be seen at 8 leagues off. At nearly three-quarters of a mile, to the eastward of the town, is Pradeiras Point, forming the N. W. point of the bay of Corunna, or the Groyne. There is a small battery on it, and a reef extends from it to a short distance.. The castle of St. Antonio, off Corunna Point, at a mile and a quarter to the southward of Point Pradeiras, stands on a rock detached from the shore, and forms the N. E. point of the harbour. Between the point and castle are several large rocks above water, and the ground on the south side of the castle is likewise foul. The most dangerous spot in the harbour is that to the eastward of the town of Corunna.

On the eastern side of the bay is the point of Mount Mera, with a battery, at about two-thirds of its height from the water. At the bottom of the bay, on the same side, is the isle and castle of Santa Cruz. In the small bay to the S. E. from Mera Point, there is good ground for anchorage but it should be used only when it is not possible to enter the harbours of Ferrol and Corunna, because a heavy sea is driven into it with a wind from N. W. or north. On the Tonina bank, which lies off it, there are 10 fathoms at low water, yet the sea breaks on it during a swell. *On the western side of the bay* is the castle of St. Diego, above half a mile to the southward of the castle of St. Antonio; these points form the entrance of the harbour of Corunna. About a cable's length to the northward of the castle of St. Diego, is a small shoal of only one fathom at low water; and at N. by W. from the same castle, and S. W. by W. from that of St. Antonio, is another shoal of 3 fathoms. On the Basuril and Cabanes banks the sea breaks during a swell, notwithstanding the depth of water upon them; so that it is necessary to be attentive when passing between them and the land.

IN ADVANCING FROM SEA, IN EASY WEATHER AND FAIR WIND, from the N. E. or N. W. quarters, you may steer for the points of Seixo Blanco and Mount Mera, until you observe the castle of St. Diego come by that of St. Antonio, taking care to avoid the rocks on the western side, steer on for Diego, pass Antonio, and, when between these castles, choose your anchorage. If your ship be large, bring St. Antonio N. E. by E., and anchor in 6 or 7 fathoms, oaze and mud; a smaller vessel may stand further in, having St. Antonio E. N. E., or E. by N., or even more advanced; always taking care not to anchor in those parts encumbered with the sea weed, for, with heavy gales, the anchor will not hold. It is usual to moor north and south.

In attempting the harbour during a gale from the northward or N. W., the passage in is between the Basuril bank and the western shore, having the Tower of Hercules to the S. W., and at such a distance that you can see its base. Hence you pass Ravaleira Point, and the rocks which lie off it, which may be passed at the distance of two cables' length. Now steer S. E. with the hill and battery of Mera ahead, until St. Diego castle, near that of St. Antonio, be brought on, when you run S. W. and enter the harbour, leaving the last mentioned castle at the distance of a cable's length, then proceed as before directed. But if you are desirous of running between the Jacentes bank and Seixo Blanco Point, you must stand toward the mouth of Ferrol harbour, until Cape Priorino bears N. N. E., then bring Point Segans in one with St. Christoval's chapel, (which is in the bay of Carino,) and steer on until the castles of St. Diego and Antonio are in a line, and stand on thus until Seixo Blanco Point bears E. S. E., from thence southward, until the battery of Mera bears E. N. E., then attend to the directions given before.

General Remarks:—In making for the harbours of Ferrol or Corunna, you ought to be careful to keep off the land at night, for the currents may drift you into danger; perhaps you cannot do better than pass your night in the neighbourhood, or to the westward of Cisargas islands, standing off and on, as occasion may require, for lying-to may be dangerous, and, if the wind be from the S. W., you will find a current setting strongly towards Cape Ortegal. Be careful to provide against being driven to leeward of Ferrol, for, with a large ship, no port on this part of the coast can ensure safety.

When blowing from the N. E. you may run within two miles of Cape Prior, and thence steer for Priorino; then, if the gale be not too powerful, you may run for Carina or Corunna. Some dependence may also be placed on your soundings, for, from the regularity of them, and the noise of the sea dashing against the shore, you may, in thick and dark weather, judge by them your distance from the land.

The Wind, on the N. W. coast of Spain, is, in the summer season, most prevalent from the north-eastward. On the coast of Portugal the winds are, generally, from the northward, during two-thirds of the year; and, at Lisbon, it has been found that the wind varies, at times, from that without the harbour; thus, when the wind in the Tagus is from S. E. or S. E. by S., that without is frequently no better than S. by E. or S. This difference, however, most commonly occurs in the winter season.

Cape St. Adrian lies W. N. W. ½ W. 6¼ leagues from Corunna lighthouse; off the cape lie the Cisargas islands, bearing from Cape Prior nearly W., and from Cape Ortegal W. ½ S., distant 50 miles. The shore between these capes bends in to the southward, and has the mountain of Penaboa about 1½ mile from Hercules' tower, near which is Port Santa Cruz, fit only for fishing craft. Three miles further is Mount Pedro, with a sandy beach on each side; and 6 miles further is Cayon, another small harbour. The low flat shore of Baldayo then runs a considerable way; and about

5 miles from Cayon is a rocky island, close in to the shore, to the northward of which runs a bank of rocks, above two miles out; at low water seven of them are visible, but, at high water, only the middle one is to be seen. Between these rocks and the land is a passage, half a mile wide, so that vessels may run through, if necessary, in safety, there being 14 and 15 fathoms within it. It has been asserted that a shoal lies about this part, with only 5 fathoms over it, although close to it are 40 fathoms, and that by keeping the Tower of Hercules open of the land, you will always avoid it. *We do not believe any such shoal exists, but mention it merely on the authority of the Spanish pilots;* there can, however, be no harm in steering so as to shun it.

Proceeding towards Cape Adrian, you meet the small harbour of Malpica, fit only for small craft. Here rises up mount Boa, the foot of which extends to Cape Adrian. From off this cape several islands, rocks, and shoals extend two miles to the northward. Through these islands are several channels, with from 6 to 10 fathoms water; the ground wholly rocky and bad. A vessel may also, if urged by necessity to do so, pass between these rocks and Cape Adrian, with W. or N. W. winds; or, if coming from the eastward, with E. or S. E. winds. The current with flood is strong, and sets to the eastward.

Three miles and a half from hence is Point Nerija, of moderate height, and having many rocks running from it; behind which, to the eastward, is the harbour of Barizo, frequented by coasting vessels: in entering you should keep to the western shore, which is clean, but far up the water becomes shallow. From Point Nerija the shore bends inward, then runs out to Point Roncudo, round which are several rocks and shoals, which, by giving a berth to, may be easily avoided. Point Roncudo is the northern point of the bays of Corme and Laxe, on the N. N. W. and W. shores of which the water is deep enough for most vessels, but the bottom is rocky. W. by N. from Roncudo point lies a sunken rock, with not more than 3 fathoms over it at low water. Several rivers, with excellent water, fall into the bays of Corme and Laxe, and a whole squadron may readily be supplied.

The Point of Laxe, which may be called the S. W. point of the bays of Corme and Laxe, is above 2½ miles to the S. W. ¼ W. from Point Roncudo, appears high, but is low at the extremity, and a reef stretches from it to the N. W. about two cables' length. A shoal also extends from it E. N. E. to half that distance. Point Catasol, at a mile to the southwestward from Point Laxe, is high and of a sandy colour, with large rocks and shoals at its base. Ten miles from Laxe is Valea de Tosta, very low, and encircled with rocks, although, behind the point, several high mountains rise up with rugged peaked tops. At a mile from Valea de Tosta is Cape Villano, not very high, but perpendicular towards the sea. Within it, at a short distance, is a sharp peak, of a red appearance, resembling a high tower. N. N. W. from the cape, about 1½ cable's length, is the Bufardo shoal, small, but peaked at top, the water breaking over it, though all around is deep water.

To the southward of Cape Villano is the bay Camarinas, obstructed by rocks, and frequented only by the neighbouring coasters. Off the entrance lie the rocky shoal named the Quebrantes, and the depths over it are from 7½ to 3 fathoms, except at its northern end, where, at low water, it appears above the surface, in shape like a buoy. This rock bears from Cape Villano W. S. W. one mile and a quarter; and, at W. N. W. from it, about half a league, is another shoal, over which, with gales from the eastward, but not less than 6 fathoms has been found upon it.

Buytre Point, two miles to the south-westward from Camarinas bay, is high and steep; near it are two large rocks above water. Cape Toriano, which lies 5 miles further, in the same direction, making a sharp and steep projection into the sea; it is not very high, and, when seen from between E. N. E. and W. S. W., it resembles the awning of a galley. At a distance it is not always distinguishable from the high land at the back of it. At two cables' length W. N. W. from the point of the cape, is a small sunken rock, which breaks with a little swell. The Nave' of Finisterre, a high mountain so named, stands at the distance of 5⅔ miles to the S. S. W. from Cape Toriano. Its summit is flat, and, at about one-third of its height from the sea, there appears to be a short point with hummocks on it, and having at its base a small but high island. In the bay formed between Cape Toriano and the Navé of Finisterre, vessels may safely anchor during north-easterly and easterly winds, off a fresh water rivulet, in from 6 to 8 fathoms, sandy bottom, but not in deeper water, as there the bottom is rocky. Care must also be taken not to advance too near the north shore, as it also is foul.

CAPE FINISTERRE is a remarkable and well-known headland, lying in latitude 42° 56′ 30″ N., and longitude 9° 16′ 15″ W. It is neither so high nor so flat as the navé; but is steep, uneven, and the landing is inconvenient. Between the cape and the navé is a kind of roadstead, where the land is low; by this the cape may be readily recognised, for there are no appearances like it on this part of the coast. To the northward of the point of Cape Finisterre lies the little island Sentolo; and, at 3 cables' length S. S. W. (South) from the cape is a sunken rock, about the size of a man-of-war's boat, called Turdeyro, which has over it only 2½ fathoms of water. In advancing from the S. W. towards this rock, Mount Lizaro will be seen to the eastward, and may be known, not merely from its height, but from its singular formation, as its summit consists of an assemblage of small pinnacles, resembling the teeth of a saw.

Within Cape Finisterre, the land, for more than half a league to the N. E., is high and precipitous, Here stands the town, with a pier annexed to it, chiefly for the use of fishermen. To the eastward of the town there is good anchorage and shelter during N. E., North, and N. W. winds, in from 12 to 24 fathoms. In the summer, when the north-easters are of long continuance, this place is much frequented; but so soon as the wind appears to be getting round to the S. E. or S. W. it is necessary to put off to sea. E. S. E., 4½ miles from Cape Finisterre, is a large cluster of islets and rocks, named the Grand Lobeira; at half a cable's length, on all sides, the ground is clear and the water deep. The Little Lobeira lies S. by E. one mile from the former; its rocks are of all sizes, and small fishing vessels, at times, pass among them at high water. About this cluster the ground is foul, and a reef extends from it to the shore, a distance of one mile and a quarter to the S. E.

The Bay of Corcubion, on the east of Cape Finisterre, has, in its N. E. corner, an inlet, more than 2 miles in length, which affords excellent shelter from northerly winds. This is the Haven of Corcubion, having a regular shoaling of from 13 to 2 fathoms, the ground of sand and mud. There are several clusters of rocks without the mouth of this haven, but they may be seen, and therefore easily avoided. In sailing for this place, from off Cape Finisterre, a course E. by S. 5½ miles, will lead clear of the Great Lobeira, and a N. by E. course leads thence directly into the midway of the harbour. This harbour should not be attempted without a favourable wind.

The Minarsos Rocks, encircled with shoals, lies S. by E. ¾ E. from

Cape Finisterre, distant 7½ miles. To the westward of these rocks, distant 1½ mile, is Point Remedios, over which may be seen a little conical hill; and, at one quarter of a mile to the eastward of the latter is another hill, of the same shape, but larger; the point is low, and a ledge of rocks extends in front of it. Duyo shoal lies about 3 miles to the northward of Point Remedios; it is rocky, of small extent, and has over it a depth of about 2½ fathoms. To the extent of 5 miles, southward of Point Remedios, the edge of the shore is low and lined with rocks, but the interior is elevated to a considerable height.

MOUNT LOIRO is high, round, and separated into two points or peaks, which, at a distance, appear like an island; on the southern and highest peak is a watch-tower; this point is easily known, and forms the north point of the inlet or bay of Muros. N. W. ½ W., 5½ miles from Mount Loiro, are the Meixido shoals, very dangerous, but the water constantly breaking over them renders their situation distinct and visible; there is a good passage between them and the shore, one league wide; but, if running on the outer side of the shoal, bring the navé of Cape Finisterre open of the cape; you will then be close to the westward of the shoal. Nearly 3 miles, W. N. ½ W., from Mount Loiro is a cluster of rocks, called the Bruhios, so low that the sea frequently dashes over them. Mount Loiro itself has some rocks off its point, called the Leixones; between them and the shore is said to be a narrow channel, but too dangerous to be attempted without a pilot.

INLET, OR BAY OF MUROS, may readily be known by the appearance of Mount Loiro; but, if this hill should not be visible, you will, to the northward, perceive Cape Finisterre or Mount Lizaro, or, to the southward, the hill of Curota, the highest of any at this part. To enter this bay, with the wind from the northward, you must run under Mount Loiro, leaving the Leixones rocks on the larboard side, and giving a good berth to a reef that stretches from a point above it. Should the wind not allow to stand directly towards Muros, you may, with a tack or two, get abreast of the town, and there anchor in 8 or 10 fathoms, muddy bottom, mooring north and south; as the on-shore wind, although from the eastward, raises a heavy sea, and has occasioned the loss of many vessels. From the Punta de Castro and the Atalaya of Son, on the eastern side, are two dangerous ledges; the latter is a point of moderate height, and precipitous, having a chapel on its summit. Close to it, on the east side, is the town of Son, with a pier for the protection of fishing barques, &c. S. W. by W. from Point Castro lie the rocks of Besonas, and near them is a depth of 5 fathoms, increasing to 9 and 11 fathoms, on the eastern side. To the eastward of Cape Corrobedo is Tombo Mayor, a hill of moderate height; and to the S. W. of it is the Little Tombo, which is neither so high nor so pointed. Cape Corrobedo is low and encircled with rocks; W. S. W. from it, distant 3 miles, is a reef extending N. N. W. and S. S. E.; on the N. E. side of the latter is a small shoal; on both the sea always breaks when there is a swell. The Preceiros rocks, with breakers around them, lie at the distance of one league, S. by W. ¼ W., from Cape Corrobedo.

SALVORA ISLAND, high in the middle, but very low at each end, is at the entrance of Arosa bay. It is about 1½ mile in length, and appears of a reddish colour, having a chain of rocks extending from it to the northern shore. On the East and N. E. sides of the island are several large rocks, and off the south end is one, at the distance of 1½ cable's length, seldom seen above water, with breakers around it. Between Cape Corrobedo and Salvora, at 3½ miles to the S. S. E. of the former is the point and small town of Carreyra; and W. S. W. 1½ mile from Point Carreyra is a steep islet, with a number of other rocks between it and the point.

THE BAY OF AROSA, within the isle Salvora, is extensive, and affords anchorage, but its shores are generally shoal and rocky, and so many reefs line the coast, as well as impede the navigation, that it has been described as too rocky and dangerous to be attempted by any who are not acquainted with it; to which has been added, that even small vessels fishing here have been frequently lost. It, however, appears from the chart of Tofino, that the passage into the bay, on the east of the island Salvora, is two miles in breadth, and has a depth of 22 to 34 fathoms, which depth continues 5 miles to the N. E., so that, in case of emergency, a vessel may safely take the harbour, and lie sheltered therein, with the eastern end of Salvora bearing S. W. ½ W. 5 miles, and the elevated church of Santa Eugenia N. W. by W. 3½ miles; depths 25 and 26 fathoms. At the island of Arosa, in the middle of this bay, the time of high water, on the full and change, is 3h. 45m. The tide flows 5, and ebbs 7 hours.

From the south end of Salvora the Island Ons lies 5 miles S. S. E. ¼ E. It is nearly 3 miles in length from N. E. to S. W., and is of moderate height, level on the top, but rugged on the western side, and bordered with rocks; at the south end of Ons is an islet, named Onza, having a small beach on its eastern side, but otherwise rocky and foul. At about three-quarters of a mile W. S. W. from Onza is a rocky shoal of 5 fathoms, over which the sea breaks in rough weather. A large rock, called Sentolo, lies close to the island Ons; and, nearly in mid-channel, between this and the main, is the Golferass shoal; and a reef also extends from the coast near Lanzado, on the east. Vessels, therefore, which proceed for Pontevedra, to the northward of Ons, have to pass either between the latter reef and Golferass shoal, or between the Golferass shoal and the island. The latter channel is the safest, as you may pass within a stone's throw of the Sentolo; but this is to be attempted with a leading wind only. In easy weather many vessels run through these channels, as the depths are from 9 to 6 fathoms, rocky ground; but, with a swell, both are dangerous, as the sea breaks all over them.

PONTEVEDRA. This harbour is formed by Cape Udra, on the south, and Point Cabicastro, on the north. Between these points is a fair channel, two miles in breadth, though there are in general rocks off the projecting points on both sides of the harbour. The course in is E. S. E. until the isle Tamba, which will be seen at the upper part of the haven, appears midway between the two coasts, whence the course up to the south end of that island will be E. by N. 4 miles. Within the isle of Tamba is the road or anchorage of Pontevedra, the river being dry at low water; its depths are from 8 to 2 fathoms, bottom of mud. Pontevedra is one of the principle towns of Galicia; it is two miles up the river, and, at the entrance of it, even coasters must wait for the flow of the tide to carry them up to the town. High water, full and change, at 4h. 0m.

From Point Udra the coast runs up towards the bay of Aldan, having a stream of excellent water at the town of that name, in the bottom of the bay. But the east side of this place is studded with rocks and shoals so much, that no vessel should even venture to bring Udra point as far as N. N. E. The Harbour of Aldan is of good depth, and clean sandy bottom, and can accommodate ships of every description; at its entrance are from 15 to 17 fathoms water, decreasing as you advance into it. It is advisable to moor E. N. E. and W. S. W., because the winds from the N. N. W. are dangerous, and bring in a swell of the sea. To sail into this bay you should have a leading wind, and then keep mid-channel, standing on for Point Con; leaving Bouteye to the starboard, run up to the low shore of Arnela, within two cables' length of which is the anchorage. Point Cousa is the southern point of the harbour of Aldan; it is high and steep, having a shoal to the northward. Point Cabicastro is distant from Point Udra 2¼ miles, and Point Udra from Point Cousa 2½ miles. Three miles and a half further is the point of the entrance to Vigo.

VIGO. Off the entrance of this inlet are the *Bayona Isles*, which are uninhabited, high, and uneven on the summit, very steep on the west side, but less so on the east. The north point of the northern isle is called Point Caballo; and off it, at the distance of a quarter of a mile N. N. W., is the Roncosa shoal, which appears, at low water, above the surface. At half a league N., 5° W. *(by compass)* from Point Caballo, is the Biduidos shoal, having 3½ fathoms over it, at low water, steep-to on the north side, and having on the south from 6 to 7 fathoms, increasing to 15 at a short distance. The S. E. end of the southern isle is called Cape Vicos; and, from it W. S. W., at two-thirds of a mile, is Boiero islet, which, in a heavy sea, is washed over by the waves. This islet is surrounded by smaller rocks. S. S. W. from Cape Vicos, distant 4½ miles, is Cape Silleiro. The channel between is called the SOUTHERN PASS OF VIGO. Cape Silleiro is high and rugged; at its base is a low point, terminating in a ledge of rocks, that extends a quarter of a mile to the N. N. W.; part of this ledge may be seen at low water, but during a swell, the sea breaks over it.

VIGO BAY is entirely enclosed with high mountainous land; but its most remarkable object, at a distance, is a sharp pointed hill, on the south side, having on it the chapel of N. S. de Olva, which may be seen at a great distance, and to those bound hither a knowledge of it is of great importance. Within the South Pass of Vigo, the first point on the East is Cape Estaya, which is black, having a reef stretching from it to the distance of two cables' length to the N. N. W. To the north-eastward of the cape is the little island Toralla, equal to the point in height, and at a distance appears to be a part of it. Within Cape Estaya, 2½ miles, is Cape de Mar, which is low, and of a sandy colour, projecting considerably into the sea, and constitutes a principal mark for leading into the harbour. Without it, to the distance of two cables' length, a reef extends, part of which is visible at low water, but the whole is covered with a flood, and the sea, with a swell, breaks over it. Opposite to Cape de Mar, on the north side, is Borneyra point; low at the extremity, but rising, northward, to a considerable height; its reefs, with rocks above water, extend out to nearly half a mile. The town of Vigo is three miles above Cape de Mar. It has many fishing barques and coasters, but little other trade.

If you are desirous of reaching Vigo by the northern passage, with a favourable wind, steer under the south shore of Onza Island, within the distance of 3 miles; then stand to the eastward, until you have Monte Ferro quite open to the east of Point Caballo, (the north end of the Bayona Isles) with the hill of N. S. de Alva quite hidden by Cape del Hombre, when you will be clear of the Biduidos shoal, and may round Point Subrido, giving the land a berth of at least a cable's length; next steer for Cape de Mar, until you gain the middle of the bay, whence you make for the town of Vigo. Care must, however, be taken not to bring Points Subrido and Caballo in one, until the church of Cangas, on the north coast, be open, when you clear the reefs of Borneyra. In case of a change of wind, be cautious not to approach either shore nearer than in 8 fathoms. Without the reefs, the ground of the bay is, in general, of mud and sand.

To sail into Vigo Bay by the southern passage. You should bring Cape Mar (known by its sandy colour) in a line with the chapel of Guidance, to the north-eastward of Vigo. This mark will lead through the mid-channel, 32 to 37 fathoms, until Monte Ferro bears S. S. W., thence steer more northerly, for the channel between the reefs of Borneyra and those of Cape de Mar; taking care, as before directed, not to bring Subrido and Caballo points in one, until the church of Cangas be open. Hence you proceed to the town. The beach of Vigo is clean, and there is a good depth before it, wherein is the usual anchorage, in from 13 to 8 fathoms, mud. It is usual to moor with the best anchor to the north and the other south; a ship will lie thus well sheltered from the sea on the west by the Bayona Isles. It is, however, said that off the village of Seis, about two miles higher, they may be safer; as they here make fast a cable on shore, and carry out an anchor to the northward, when lying in 6 fathoms. To the eastward of Randa point, which is two miles above the road of Seis, many vessels may anchor, in from 15 to 6 fathoms, bottom of mud, in safety from all winds; and, above this part, vessels coming in without anchors or cables, may run aground anywhere on the mud, until necessaries can be procured, when they may be lightened and come off safely.

THE HARBOUR OF BAYONA lies on the southern side of Vigo bay, and behind the isles of Estella; it is small, and filled with shoals. You will find shelter to the S. E. of Point Tenaza. This place should not be attempted without a pilot. From Point Tenaza the coast runs southerly to Cape Silleiro, all steep-to and foul; the cape is high and rugged, from it runs out a ledge of rocks N. N. W., a quarter of a mile, which the sea breaks over. To the eastward, on an eminence, is the chapel of N. S. de Cela. From the breakers of Cape Silleiro, the coast runs S. by W. ½ W. to Point Montador, which has some rocks before it; and to the southward is the town of Oyo and a battery; three leagues further is the hill of La Guardia, having a small town and creek at its foot, used chiefly by fishermen. To the S. S. W. the land is lower, until you reach the sugar-loaf hill of St. Rego, having two peaks, on the highest of which is the chapel of St. Tecla, which serves to point out the situation of the RIVER MINHO, the boundary of the kingdoms of Spain and Portugal.

THE COAST OF PORTUGAL. From Mount Tecla to Cape Viana, the coast runs S. W. about 3 leagues; and is of moderate height, but rises behind to a range of mountains, higher than those to the northward, and visible 16 or 18 leagues off, forming a good object to know this part by, when coming from sea. Cape Viana is the north point of the river Lima, Cape Nivos being its southern point. The town has a white appearance, and stands on the north side of the river. From Cape Viana a reef runs out southerly. When about to anchor, bring the town to bear E. N. E.; but, to enter the river, you should have a pilot, for the bar is both shallow and dangerous. Here a low shore begins, extending southerly a full league; it then becomes somewhat higher and even, but lined within by ranges of hills, as far as Villa del Conde. Here some white buildings mark the entrance to the river, where the town stands. Within this space are the towns of Espozente and Font; between which runs a small river, with about 6 or 7 feet water. Opposite the town of Font are two ledges of rocks, running out 1½ mile, even with the water's edge, called Caballos; come not closer to the shore, in passing, than 14 fathoms; but if to the southward of them, you may lessen your water to 9 and 8 fathoms.

VILLA DEL CONDE is a bar haven, and has several rocks scattered about its entrance; but ships may sail among them on every side: the narrowest channel is on the northern side, having 5 and 6 fathoms water. Further in is a bank, crossing the haven, with only 2 fathoms upon it at high water; but within this bar the haven is 3 and 4 fathoms deep; the north side is filled with rocks under water; but on the southern side are 5 and 6 fathoms, and round the mouth of the river are 9 and 10 fathoms. A pilot will always be found necessary for this haven. Steering south you will perceive the great rocks, called Leixones, between which and the main is a passage with 6 and 7 fathoms; and about half a league S. W. of these rocks, lies a rock under water, named Filgueira. You will then distinguish, at about a league's distance from the Leixones, fort Queyo, standing upon the northern entrance of the river Douro, upon the north shore of which is the town of Oporto.

OPORTO. The mouth of the Douro, or river of Oporto, lies 4½ leagues to the southward of Villa del Conde. The town of Oporto stands high, having a black steeple near its centre; and as you get near the land, the tower of John de Foz will be seen, near the mouth of the river; also, the chapel of No. Sa. de la Luz, and near it a light-house, from which is exhibited a fixed light. On the north point of the entrance is the castle of St. Joaô de Foz, from which extends a ledge of rocks to the S. W., some always above water. Without these is another ledge, Filgueira, always visible, and to be left on the larboard hand, when entering the river. The south point of the entrance, Cabadelo, is a low sandy point. Those advancing should previously ascertain their latitude, and know that with south-westerly and north-westerly winds, a heavy sea sets in along the coast.

THE BAR OF THE DOURO is liable to considerable change, occasioned by the sudden swellings of the river, termed *freshes*, and from the heavy westerly gales to which it is exposed. The freshes most frequently take place in the spring of the year, and proceed from the melting of the snow on the mountains of Spain. The rise of the water in the river, at these times, is frequently as much as 40 feet; and the rapidity of the stream is so great, as to break vessels adrift from their moorings, and occasion their total loss, it being impossible to afford them the smallest assistance. As no dependance can be placed on the anchors, in these times of danger, precautions are generally taken by the masters of vessels, to secure the end of a cable to trees on the bank of the river; or to stone pillars, which have been provided for the purpose. They have ample time for preparation, as the approach of one of those freshes is communicated from the interior, several days before its arrival; during which time the river gradually swells and attains its greatest height. The ordinary rise of neap tides is from 6 to 8 feet, and that of springs from 10 to 12 feet.

The bar being liable to alterations, &c., as before mentioned, renders it absolutely necessary to employ a pilot. The pilots are generally fishermen of the port, who are always ready to go off, when a vessel comes in sight; unless the weather prevents their getting out, or if it be so thick that they cannot discern the marks, the land being low and level. You first enter with the chapel of St. Catherine in a line with that of St. Miguel, or St. Michael, which leads over the bar; and thence proceed according to circumstances.

OBSERVATIONS ON THE BAR AND HARBOUR OF OPORTO, AT THE ENTRANCE OF THE RIVER DOURO. *Nautical Magazine, vol.* 1, *page* 507. "The first precaution to be observed, by vessels bound to Oporto, is to be certain of their latitude, as their is a great sameness in the appearance of the land, and the towns to the northward of Oporto are seen at a great distance. OPORTO may be known, with the assistance of the latitude, by its being situated about three miles inland, and partly built on a small eminence, with the black steeple of Torre dos Clerigos in the middle, and Foz before it, on the sea shore. No vessel should attempt the bar without a pilot, as it is constantly shifting, and the freshes render it extremely dangerous. Mr. Charles Gahan, the second-master of H. M. B. Royalist, informs us, that vessels are frequently prevented from entering the river for 3 or 4 weeks at a time. In addittion to which, Mr. H. J. Strutt, the master of H. M. S. Victor, commanded by Captain Ellice, says, that no vessel drawing more than 15½ feet of water can pass it at any time."

"On the extraordinary and dangerous freshes to which the river Douro is subject, Mr. Strutt makes the following useful observations: 'It is, perhaps, superfluous to observe, that the great extent of this river, the steepness of its banks, narrow bed, and debochure, as also the number of streams tributary to it, make it liable to considerable irregularity in rise and strength of current. Now, the seasons here are tolerably regular; the rains are heavy, continuous, and general. Thus the river is occasionally swollen above its customary level. Again, during the prevalence of W. and S. W. winds, to which its entrance and principal direction is exposed, its stream is more or less impeded; as those winds cause an accumulation of sand along the shore, to seaward, and upon the rocks, which are the fundamental basis of the bar. Thus arises its liability to 'freshes;' the strength, duration, and importance, depending upon the conjoined operation of some, or all of these causes.'"

"'The periodical fall of the stream being overcome, and a gradual rise continuing for two or three days, is a certain indication of one being at hand; and, when the waters begin to find vent, before the commencement of the run is perceptible, the middle of the river is covered with rubbish, patches of foam, &c. The Victor experienced one, accompanied with about 10 days rain, with little intermission, and those chiefly drizzling. During that time the wind was westerly, but neither very strong nor steady. The first indication, viz. loss of tide, was observed two days before the rubbish and foam were observed; the day following it attained full strength, and subsided on the third morning afterwards to the usual strength of current. We had 4¾ knots alongside; in the middle of the stream it was of twice that velocity. There can be little doubt that the strength of this fresh is very often much exceeded, especially in the spring of the year, when a sudden thaw on the mountainous tracts which border the river, occasions the descent of a great body of water. At all events the utmost precaution for the holding of the vessel is indispensable; the bottom is of light soil, soft, but not tenacious, and appears to be considerably agitated; and, strange as it may be thought, two vessels on the opposite shore had there bowers in the stream washed astern, a circumstance which is stated to be not uncommon at such times, owing to the rapidity of the stream.'"

"'The following precautions adopted by the Victor may be useful to vessels. The anchorage taken up by this vessel was about a mile west of San Juan de Foz in 13 fathoms water.'"

"'Aug. 12, 1832. Having had much rain, and missing the accustomed fall of the river, completed preparations for a fresh, having the small bower with 65 fathoms of chain in the stream, on the larboard bow, the best bower buried on shore with a chain, and a hemp cable clenched round a tree, on the starboard bow. Stream anchor, with 50 fathoms of chain, on larboard quarter (in the stream); stream hemp, and a 4½ inch hawser on starboard quarter, to the shore; with spare messenger, and a warp for breast-fasts. The vessel warped into little more than her own draught, with the rise of the water.' "

" '*We will now give Mr. Gahan's directions for the guidance of vessels in the Douro.*' "

" 'During the summer months the best anchorage is off the city, 50 fathoms below the rocks which show at half tide: there being no other rocks near this place, it cannot be mistaken. Moor head and stern—your small bower anchor ahead, and stream astern, hove as close as possible to the south shore, by a head and stern hawser made fast to the shore. But on the least indication of a fresh, such as having a continuance of heavy rain, or a fall of snow on the mountains (more particularly the latter, when thawing,) you must immediately move below St. Antonio de Val de Piedade convent. The following are the marks for anchoring:—Sarra convent, which is situated on a hill above the bridge just open of St. Antonio point, which is a short distance outside St. Antonio de Val de Piedade convent, bearing S. E. ½ E. (by compass); old burying-ground point N. W. ¾ N.; a large yellow house, in a valley among some trees, on the south side, S. by W. With these bearings and marks on, you will be in 20 feet water, low water, spring tides. The ship's head being S. E. the small bower anchor is to be let go in 50 fathoms, one point on the larboard bow; the stream in 70 fathoms, one point on the larboard quarter; the best bower cable to be made fast to the bower anchor, which must be taken on shore, and buried in the quay, three points on the starboard bow; a hawser from the starboard quarter to the shore, and a good hawser, or stream cable, from the starboard bow to the shore, to heave in shore by; all cables to be hove well taut; particular attention should be paid to the rise and fall of tide, taking care to heave in shore immediately the water rises, and remains above high water mark, as there is scarcely any ebb for one or two days previous to a fresh. Every precaution should be taken to prevent the vessel shearing as you heave, in keeping booms ready to boom off from the shore; a strict look out should be kept, to ascertain when the water begins to fall, taking great care to heave off as the water falls. After a heavy fresh it would be advisable to sight your anchors, or, in all probability you will lose them. The rise of water, in a heavy fresh, is 20 feet above high water mark; the general rise and fall in the river, as high up as the town, is 12 feet.' "

AVEIRO. From Oporto bar the coast runs nearly in a S. W. by S. direction as far as Aveiro, a distance of about 11 leagues, the land bending eastward, and forming a kind of bay, being near the sea, of moderate elevation, but rising mountainously inland. The beach is flat, and extends southerly as far as Cape Mondego; it is clear from danger, and, at the distance of 1½ miles, you may safely run along it, in 9, 10, 11, and 12 fathoms. No remarkable object or pointed pre-eminence is perceptible all the way to Aveiro, and that only can be discovered when you are very near the land. The bar of Aveiro, being entirely of sand, has frequently changed, and no vessel can pass it unless conducted by a pilot. Two pyramids of stone serve to point out the entrance, these kept in a line will lead to the bar; they are more than 70 feet in height, have square bases, with bands traced horizontally, white and black, and may be distinguished at 9 miles off.

The hill of Cape Mondego is S. W. ½ S. about 27 miles from the entrance to Aveiro; its summit is flat, and at a distance has the appearance of an island; but be careful not to mistake it for the *Berlings*. The land, after you have passed the cape, bends to the eastward, and, with off-shore winds, good anchorage may be found, when the cape bears North, distant

5 or 6 miles, on a bottom of fine sand, or with the cape bearing N. by W. distant 4 or 5 miles; but should the wind get to the southward, you must weigh immediately and stand out to sea, for westerly gales generally commence from the southward, and send in a heavy sea; these winds are frequently of long duration, and occasion many accidents, therefore do not get into less than 18 or 20 fathoms, or to the northward of the cape in 35 fathoms, which will be above 5 leagues off, the soundings gradually decreasing towards the shore. Abreast of the cape are 7 fathoms, a little further off 20 fathoms, and at about 7 miles distance 30 fathoms, brown sand and shells.

FIGUEIRA. The bar of the river Mondego lies about 4 miles to the S. E. of the cape, and has only 12 feet over it at low water, and it frequently changes. The town of Figueira stands on the north bank of the river, within the bar; it is defended by the fort of Santa Catarina, upon which a signal-flag is displayed, to signify that vessels may enter the river. This flag is lowered or struck when the sea is so heavy that pilot-boats cannot go off; and likewise when the water is not sufficiently high for allowing vessels to enter the river. When a gun at the fort is fired, without hoisting the flag, it is a signal to vessels to keep their station, or prepare for entering; and when the flag is afterwards hoisted, it denotes that there is water for passing over the bar

From Cape Mondego the coast proceeds in a southerly direction, bending outward to Cape Carvoeiro, a distance of 18 leagues; the land is moderately high, but mountainous inland. Carvoeiro is steep, and projects considerably to the westward, having a large rock before it, and a chapel on its summit. Within this space is the small bay of Pedernal, fit only for coasting vessels, and known by the church of No. Sa. de Nazareth, and the Lagoon of Obidos. On the east side of Cape Carvoeiro is a tract of low flat land, which appears, as you sail along, to separate the cape from the main, giving it the appearance of an island; be careful of this appearance, for, in thick weather, vessels have been known to mistake it for the Berlings, and, advancing on this apparent opening, have run on shore and been lost.*

THE BERLINGS. It is advisable when you make the Berlings, to look out for the Fairlhoens, which are high rocks, and lie to the northward of the Berlings; and you will observe the proper channel is broader east and west than the flat we have been speaking of. THE GREAT BERLING is an island of moderate height, having a hollow or cove about the middle; the shores are steep, except on the east side, where a fort is built; opposite this vessels may ride with N. W., West, and S. W. winds, and obtain plenty of excellent fresh water; but if the wind is from any other quarter, this will not be found a safe place for anchorage. Near the west side of the great island is the high Fairlhoen, with a cluster of small ones round it, called the Estellas, one of which is at the distance of one-quarter of a mile. S. S. W. of that, distant one mile, lies a rock which appears at low water. On the north side of the great island is the Little Fairlhoen; and about N. E. ½ N., distant 5 miles, lies the Great Fairlhoen, being a broad, round, ragged rock, with a number of smaller ones around it; it is nearly as high as the Berlings, and near it is another of similar size and height; a sunken rock is to the W. S. W. of it, at the distance of half a mile.

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* There is now a light-house erected upon the largest of the Berling islands, from which is exhibited a revolving light, of the first class, which makes one complete revolution in the space of 3 minutes, exactly, showing, during that time, a brilliant light, immediately followed by an eclipse.

The channel between the Berlings and Cape Carvoeiro is 5 miles in breadth, and clear, with a depth of 32 to 14 fathoms, so that whole fleets may pass through it in safety. East and North of Cape Carvoeiro, at the beginning of the low land, lies the upper town of Peniche, and on the east and south side of the cape is the lower town. There begins a flat bay, ending in a rocky point, on which stands the castle of Anparo; in this little bay a vessel may anchor with the winds from the E. N. E. to N. N. W., but not with any other. Three leagues to the southward is the castle of Encarnacion, where an extensive flat beach begins. Four leagues from Encarnacion are Ericeira town and bay; a league from which town is the convent of MAFRA, a celebrated structure, on the summit of a high hill, forming a remarkable object, by which this part of the coast may be distinguished.

CAPE ROCA, or the ROCK OF LISBON, lies 4 leagues from Ericeira. The position of the cape or rock, from the mean of various observations, is latitude 38° 46′ 30″ N., and longitude 9° 26′ 48″ W. The cape is broad and moderately high, steep towards the sea, with a tower on its summit, which is lighted by night. Near it is a high rock, and further out a shoal, over which the sea breaks, although near its outside are 40 fathoms. The land suddenly rises inland, to a remarkable mountainous ridge running easterly, with several irregular risings, having on its northern slope the town of CINTRA, from which it takes its name, and being a good mark to know the coast by. S. by W., 4 miles from Cape Roca, is Cape Razo, or Point Sinchette, having a reef very near it. The intermediate coast forms a bay, which is enclosed by a high steep coast, excepting near the point, where there is a flat beach. From Cape Razo, the coast eastward, to fort St. Julian, is everywhere steep, but clean, excepting at Point Rana, about a musket-shot to the westward of that fort, where the ground is shoal. You will, in advancing towards the Tagus, perceive the light-house called Na. Sa. de la Guia, and, further on, the fort, town, and bay of Cascaes; here, abreast of the town, is good anchorage, with from 8 to 18 fathoms; the road is sheltered from N. W., North, and N. E. winds. In running in for it, bring the town open with the castle and point; here you may obtain a pilot for the Tagus.

LISBON. Four miles from Cascaes is fort St. Julian, at the entrance of the Tagus. This fort is large, and situate on a high, steep, projecting point, having a small reef before it. The light-tower of St. Julian, which stands near the centre of the fortress, is 120 feet in height above the sea, and is lighted by night throughout the year. At 5 miles to the eastward of fort St. Julian is the CASTLE OF BELEM, standing upon a low sandy point, with a battery about it, towards the river: it is insulated at high water. The CITY OF LISBON, the capital of Portugal, is finely situated on the north side of the Tagus, and is sheltered on the N. W. by a range of mountainous land; it is built in the form of an amphitheatre; and its patriarchal church having a dome, with the royal palace, and other public edifices, present a magnificent aspect from the river.

THE BAR OF THE TAGUS. The shoal part is called the Cachop, and, for the sake of distinction, divided into two parts—Northern and Southern. The NORTH CACHOP, a rocky shoal, has but little water over it, so that in a swell from the westward, and particularly when the ebb is coming down, the sea breaks furiously over it. The northern part is the shoalest, and is about a musket-shot from the fort of St. Julian; the bank hence tends to the W. S. W. 2½ miles. Between this sand and the fort St. Julian is the North or Little Channel, the least depth in which is about 4 fathoms at low water, as it is scarcely one-quarter of a mile in breadth. It requires a leading wind, being too narrow to allow a vessel to turn in. On proceeding for it, keep under the shore of Cascaes, in a line with the lantern of Na. Sa. de la Guia; keep on that direction to Point Rana, only observing to give a berth to the shoal about that point. You next bring the Bugio tower in a line with the Monte Cordova, sugar-loaf hill, on the southern land, bearing S. E. ½ S., and must follow this bearing until fort St. Julian bears N. N. E. (north), whence you procced to the eastward, with the river open. You will have passed the extremity of the North Cachop when the factory comes in sight, by the east side of fort St. Julian. This factory is a building with several houses about it, standing at a short distance to the north-eastward of the fort. Having passed this point, you run along the north shore, which is everywhere clean, to the Castle of Belem, near which you must come to an anchor, as no vessel, of any description, is allowed higher up, until she has been visited by the officers of the health office.

THE SOUTH CACHOP has less water than the northern one, for its N. E. or inner part, named Cabeca Secca, or Dry Head, is always dry. On the middle of this Cachop, at S. S. E., nearly a mile and a half from fort St. Julian, is the Bugio fort and light-house, an object too remarkable to be mistaken by any stranger entering the harbour. At low water the Bugio appears on a dry bank; but at high water, the sea washes the walls of the fort. Between the South Cachop and the shore, to the east of it, there is a small channel which admits boats only. The tower of the Bugio is 66 feet in height.

THE GREAT OR SOUTHERN CHANNEL lies between the Cachops and the outer bar. In proceeding for this channel, it is to be observed, that the S. W. extremity of the North Cachop lies with the town of Cascaes in a line with the western slope of the hill of Cintra. The line of direction for sailing to the bar is, therefore, the Rock's Nose, or extremity of Cape Roca, seen overland, in a line with the light-house of Guia, and bearing North, until the Bugio tower and South point of the city of Lisbon are in a line, bearing nearly East. The latter mark, which leads into the great channel, cannot be mistaken, as no point of the harbour, other than that here mentioned, is covered with houses to the water's edge. With this mark on, you may run without fear; and, at the distance of about 4 miles without the Bugio, the water will be found to shoalen suddenly to 6 fathoms on the bar, at the distance of one-third of a mile to the southward of the North Cachop. Continue on the same direction until you have crossed the bar, and have advanced to the distance of 2½ miles from the Bugio, when the water will be found to deepen to 10 or 12 fathoms. So soon as the fort of St. Julian bears N. E. by N., as above mentioned, steer up directly between it and the Bugio, towards the north side of the river, when good anchorage may be found all along the shore. The only danger in proceeding thus arises from an ebb tide, hereafter explained.

It is to be remarked, that in all cases it is safer to keep towards the north than to the south shore, because the latter is very steep-to, and the water is too deep for anchorage. As the tide draws strongly on the Bugio, observe that if you should bring Belem castle in a line with the high citadel in the city of Lisbon, you must instantly tack to the northward to guide you clear of it. In order to receive the visit of the health officer, already noticed, you must bring to, off the castle of Belem, in from 17 to 14 fathoms; after which, you proceed to the road of Lisbon, on the west side of the city, and under the citadel or castle, which is upon the highest part of it. Here you must use good anchors and cables, mooring east and west, without buoys, as the tide runs here with rapidity, in the manner already described. The bottom is of mud, and the depth from 23 to 8 fathoms.

General Remarks. In sailing up to Lisbon, a pilot is indispensable, in consequence of the powerful operation of the tides, which has caused the destruction of many vessels. Off the city the ebb runs down at the rate of 7 miles an hour, so that the anchors there frequently come home, especially those with buoys, which are of no use, as, from the violence of the current, they are frequently immersed in the water. The flood tide is considerably weaker than the ebb. On the bar, at full and change, the time of high water is 11½ h., p. m.: the vertical rise is about 16 feet.

The danger in entering is, when a strong ebb is running down, opposed to a strong wind from sea, which makes a complete break, sometimes all over the bar. Under these circumstances, a vessel is almost unmanageable, and the tide may sheer her about; but in the middle of the Great or South Channel, the tide sets directly through. To enter the river, during the ebb, would require a brisk gale and all sails set, in order to make any way, or even to stem the current; and, it is to be observed, that, within the river, the wind comes very irregularly through the valleys on each side, unless it proceeds from the West or S. W. It is, however, tolerably steady, when in the direction of the river. The tide draws strongly toward the Bugio bank; and, hereabout, the waters divide into several counter-currents, so that a vessel approaching too near this bank will not obey the helm.

From the bar of Lisbon the land runs southerly, with a low sandy beach reaching within a mile or two of Cape Espichel, where it becomes lofty; it then turns easterly towards Setubal or St. Ubes. Cape Espichel rises perpendicularly out of the sea to a moderate height, its top appearing irregular, white on the north side, and red towards the south, with a chapel on the summit. To the eastward of the cape is the mountain of St. Lewis, lying inland, and a little to the northward of it is a hill of less magnitude, shaped like a haycock; these, when coming from the sea, are good objects to know the land by, and may be seen before you can discern the cape itself. About 2½ leagues from Cape Espichel is Cape Ares, which is high land. To the westward of this are the small bay and town of Cezimbra. You will readily know this place by a castle built on the top of a hill. Here, with winds from the N. W., North, and N. E., you may anchor, holding yourself in readiness to put off to sea, should the wind change. Near the land you have 7 and 8 fathoms; further out, it becomes rocky as far as 30 fathoms; it is then clear, and here large vessels generally anchor, if necessary. From Cape Ares the land continues high and bold to the entrance of St. Ubes.

SETUBAL, or ST. UBES, is a bar-harbour. On the north point of the entrance is a fort, and a little further in, the old tower of Outas, having two sentry-boxes towards the sea. You must lay your ship's head on the first sentry-box nearest the fort, bringing it nearly on with St. Philip's castle, leaving the castle a little open to the south of the box; and as you enter the river, you will perceive three red coloured precipices, in a rocky cliff, between Outas and St. Philip's castle, bring these in one, and it will lead into the river; but the sands at the entrance are very liable to alter, and therefore a pilot should always be taken to conduct you safely in. There are 20 feet over the bar, at low water, spring tides. The mariner should observe, in sailing out of this river, to get under weigh at the turn of the tide.

Nearly S. S. W. from the bar of St. Ubes, 10½ leagues, lies Cape Sines; the shore is generally low, a projecting point, called Pesqueira, excepted.

To the southward of this point are two small hills, with houses upon them, which serve to mark this part of the coast by. There is fair anchorage along the land, in from 10 to 15 fathoms, the ground clean. Cape Sines is low but steep, having a large rock before it, and another to the S. W. Between these rocks and the island of Pessegueiro, to the southward, is what is called the Road of Sines. Three leagues from the island is the entrance to VILLANOVA DE MELPONTES; the land toward which is low, and the beach sandy; at one spot is a reddish coloured precipice, which, with another, lying W. S. W. of the bar, are objects to know this part of the coast by. Villanova has a bar at the entrance, over which are only 2 fathoms at low water, and from the southern point of the entrance a sand stretches out. Between Pessegueiro island and Villanova small vessels may lie in 2 and 3 fathoms, under the protection of a fort near the island. About 3 leagues to the southward of Villanova is Cape Sardao, which is a point of high land; 5 leagues further on is Arrifona, having a bay where vessels may ride in 8, 10, and 12 fathoms, under the guns of a fortress; at the entrance is a rock, resembling a ship under sail, surrounded with other small ones. About 5½ leagues further is Cape St. Vincent.

CAPE ST. VINCENT is of moderate height; but to the northward of it the land is much higher, having many rocks about it. In coming from sea, and making for this part of the coast, you will first perceive the Mouchique mountains, which range along East and West, being divided into two parts; those to the westward are both larger and higher than those to the eastward, their summit bearing from the cape about E. N. E. ¼ E., and may be seen in a clear day full 25 leagues off. Having obtained sight of these mountains, you will next descry the elevated land to the northward of the cape, which will readily point out the situation of the cape itself. On the cape is a convent, and about 20 fathoms from the foot of the cape is a rock, large and high, there being a passage between it and the land, with a depth of from 10 to 15 fathoms, coarse sand and shells: outside this rock, a boat's length, are 11 and 16 fathoms, and a cable's length, 20 fathoms.

Nearly 3 miles from Cape St. Vincent is Point Sagres, nearly of the same height, and perpendicular; but the coast thence to the N. E. declines in height. Point Piedade, at 5 leagues to the eastward of Sagres, marks the entrance of the port of Lagos, and is the termination of a range of high land, called that of Barril. This point is of moderate height, broken and rugged, with a number of large rocks before it. On the summit is a chapel, and on the south side a shoal extending to the distance of nearly half a cable's length.

THE BAY OF LAGOS is clean and capacious: in summer a number of vessels may anchor within it, sheltered from N. W. to the N. E. winds, but exposed to all others. Within less than a cable's length from Point Piedade, there is a depth of 9 fathoms. For a ship of war, the best riding will be 18 fathoms, east from Point Piedade, distant one mile; a frigate may lay nearer to the shore, in 15 fathoms; and smaller vessels before the town, in 8 fathoms. The northern beach is low, and the river within is navigable, but requires a pilot; for, near its mouth the bottom is rocky, from shore outward to the depth of 18 fathoms. Seven miles from Point Piedade lies Ponta de los Hermanos, a point of middling height, not projecting; and this is considered as the termination of the Bay of Lagos. The little river of Villa Nueva is 10 miles E. ½ S. from Point Piedade. It has a shoal bar, and on each side a battery. Captain Smyth says, "There is a depth of 16 or 18 feet of water on the bar; but, in my opinion, it is only a summer watering place; as the Portuguese told me, that in winter the bar is seldom passable for ships, as the breakers are very dangerous, and the swell a long way outside it."

Five miles from Villa Nueva is Cape Carboncro, moderately high, having the fort of La Rocca, Encarnacion, near it, serving for the defence of two small bays lying on each side of the cape. Two miles further is another fort, La Rocha, built upon a bluff point, which projects into the sea, having also a small bay on each side of it, affording shelter in winds from the N.E. and N.W. Nearly E.S.E., 5½ miles from Cape Carbonero, is the Point of Albufeira; on the east side of which is a small bay, the town being at the further end, built upon a height near the shore, enclosed with walls and ancient towers. On the beach is a battery. Vessels may here find shelter from winds in the N.W. to the N.E. quarter, the anchorage being good. S.E. from Point Albufeira, 12½ miles, is the city of Faro, the coast forming a circular bight; midway stands the town of St. Antonio de la Quarteira, built on a rising ground, with a river and fort adjacent.

THE CITY OF FARO stands at the distance of 12½ miles south-eastward from Albufeira. Cape Santa Maria, or St. Mary, the southern extremity of three low islands, lies S.E. by E. ½ E., distant 18 leagues from Point Sagres of St. Vincent. The three islands form the channels of the port of Faro, each of which has a bar; that on the west is called the Baireta, or Little Bar, and has only 10 feet over it at high water; that on the east is the Great Bar, and has 13 feet; the middle one, called Barra Nueva, or the New Bar, 9 feet. Eastward of Faro may be seen the chapel of St. Antonio, and, further east, the village of Hullon. The middle island properly forms the Cape Santa Maria, which is low and sandy, with 2 and 2½ fathoms, a cable's length from the shore; three cables' length off, are 3 fathoms; and at the distance of a mile off, are 9 fathoms, rapidly increasing to 20 and 25 fathoms; so that, at a league off, there are 80 and 90 fathoms, and, a little further, no ground at 150 fathoms. The bottom is generally sandy, with some shells intermixed.

In making for this cape you will observe an inland mountain, called Monte Figo, which is visible 16 leagues off, and not like any other about this part. When seen from the westward it appears by itself, and not attached to the northern range of hills, but when viewed from the southward they will appear grouped and confounded together. It will, in coming from the westward, not be seen before you have passed Sagres, and cannot be perceived at the distance of Cape St. Vincent. There is a little hill to the eastward of Mount Figo, which somewhat resembles it in shape, called the Little Mountain.

To the eastward of Cape St. Maria is the small barred entrance of Foseta; and a little further on is Tavira, fit only for small vessels and coasters, and then only to be entered with a pilot; but before the latter place you may anchor in 4 or 5 fathoms, having the wind off shore. The whole coast, from the great bar of Cape St. Maria to Tavira, is encumbered with islands, separated from the main by narrow channels and salt ponds, navigable by boats. Ridges of high land appear up the country, from Mount Figo to Ayamonte, the latter being a remarkable object, and visible still further off than Mount Figo. About 4 leagues from Tavira is the entrance to the river Guadiana, which here divides Portugal from Spain.

THE RIVER GUADIANA is bounded on the west side by Point St. Antonio, which is low and sandy, having a reef or bank extending from it nearly south, above a mile, called the Western Picacho; and on the east side by Point Canclas, from which also a similar sand runs out, about 2 miles, called the Eastern Picacho; between these banks the channel, or bar, is about a cable's length in breadth. On the western side is the town of

Villa Real, and, further on, Castro Marin; but, between these places, a branch of the river runs to the westward. One mile up the river Guadiana stands the town of Ayamonte, on the opposite or eastern side. This part of the coast may be known by a remarkable mountain called Monte Gordo, which stands above Ayamonte. In sailing for the bar it will be requisite to engage a pilot, as the general depth upon it, at low water, is only 6 feet; but within the bar will be found 3 fathoms. The tides rise about 12 feet.

Between the rivers Guadiana and Guadalquiver, there is no place of trade which can be entered by a stranger without a pilot. Every river has its bar of sand, and the coast is low and sandy. The distance from the bar of Ayamonte to that of Huelba or Palos is 7 leagues; and from Palos to St. Lucar, the sea-port of Seville, 10 leagues. Within the latter extent is a chain of sand hills, upon which stand several towers, and by these its distance may be estimated. On the north side of the entrance to St. Lucar is the point and tower of St. Jacinto, which appear among the sand hills, at about three cables' length from shore. From this point, on the N. W., is a dangerous rocky shelf, called the Cape Bank, some parts of which appear above the surface at low water; it is about a mile in length, and half a mile broad. Within the extent of two miles W. S. W. ½ W. from the extremity of the Cape Bank, are three rocky shoals, which may be considered as the bar of St. Lucar; and off these, the outer one, Picacho appears above the surface at low water.

SAN LUCAR. Nearly S. W. by W. from Point Jacinto, distant 4 miles, is Point Chipiona, or the southern point of the river Guadalquiver, low and flat, having a reef running N. W. from it about a mile, called El Perro, or the Dog; within it a number of fishing crawls may be seen. W. N. W. of Chipiona, about 2 miles, lies the north end of the Sabinal shoal, extending about a mile N. by W. and S. by E. At low water this bank is visible, but at other times the sea breaks over it; near its western side are 5 fathoms, but there are other shoals between it and the land. At the distance of half a league to the eastward of the Perro and Point Chipiona is Point Montigos, low and rocky, with a reef extending along-shore to St. Lucar, two miles, which is 1¼ mile broad; so that the channel between it and the Picacho, before noticed, is narrowed to so small an extent that, with scanty or contrary winds, no vessel drawing more than 14 feet should attempt it, even at high water, it being too narrow for any but coasters. The depth at the entrance, low water spring tides, is 2¼ fathoms; at high water, 2 fathoms more: the bottom gravel. From the above, it is evident that every stranger ought to have a pilot, if bound in for St. Lucar. From St. Lucar large vessels ascend to Seville, which is more than 16 leagues from the sea.

The Corrales of Regla lie S. by W. ¼ W., one mile and a half from Point Chipiona. It is a dangerous flat, covered with rocks and stones, extending outward to half a mile from shore; a number of fishing crawls are extended before it, to the distance of two cables' length. Between Point Chipiona and this shoal the coast forms a bight, with a flat beach, in the bottom of which, near the shore, you will see the Convent de Regla, and, further on, the tower and high land of Beva. Point Candor lies 6 miles south from Point Corrales. At one-third of this distance is Point Meta; and, at more than two-thirds, the coast is flat, and bordered with rocks. The point, small, flat, and sandy, with a reef running from it all the way to Rota, at the entrance of the Bay of Cadiz. This place has a pier near the point, but it admits small coasters only, and those at high water.

BAY AND HARBOUR OF CADIZ. The entrance to this harbour is between the town of Rota and the city of Cadiz. Cadiz is the first commercial city of Spain, being the centre of commerce with the Spanish colonies. It is situated on the end of a low peninsula, constituting the northern extremity of the isle of Leon. This isle is separated from the main by the Rio de Sanctri Petri, which is 3 leagues in length, with a depth of 3 and 4 fathoms. Puerto Santa Maria lies 5 miles to the north-eastward of Cadiz. The river Guadaletta, which flows past it, is navigable, but has a bar of only one foot at low water. The city of Cadiz, being destitute of good water, is supplied from this place. San Fernando stands on the eastern side of the isle of Leon, distant 7 miles from Cadiz, and is connected to the main land by a bridge over the river Sanctri Petri. On the other side is Caracea, which includes the arsenal, &c. &c.; and on the shore of the inner road, opposite to Caracea, is Puerto Real, a small town, inhabited by seamen, workmen, &c., principally supported by the neighbouring salt works.

The Trocadero is a small channel, two miles long, lying to the westward of Puerto Real. It is furnished with extensive quays, and has several maritime establishments. This channel is only 34 yards broad, and vessels going in or out have therefore to wait for full tide, as at the mouth, the depth, at low water, is only 7 feet, increasing inwards to 9, 10, and 12 feet.

The Tower, or Light-house of St. Sebastian, stands on the west point of Cadiz. The light is excellent; it revolves once in a minute, and is clearly seen, in fine weather, more than 6 leagues off. S. by E. ¼ E. from the light-house, at the distance of 5½ miles, stands the Torre Gorda, or Great Tower, (called also the Tower of Hercules) on the top of a little sand hill; it is round, and below it is a battery. Care must be taken that it be not mistaken for the light-house of Cadiz, especially in thick weather, as the coast between is a very low beach, and without it are several reefs. It is also to be observed that, at the distance of 12 miles, N. ¾ E. from the light-house, stands the Casa de Beva, a tower on a lofty ridge, which may be seen from the surrounding country at a great distance. It is square, has a cupola on it, and stands between two large houses. From Rota the bearing and distance to this tower are N. by E. ¼ E., 6 miles.

Rocks and Shoals. From the point of St. Sebastian a reef extends more than half a mile to the west; and at a third of a mile from the light-house, N. W. by W., is the *La Olla*, or Kettle Rock, having only 6 feet water over it. N. N. E. ¾ E., about one mile from the same tower, are two small black rocks, called the *Cochinos*, or Pigs, visible at low water, but covered at full tide; these are in a line with the two towers of the Carmelite church; within these, and near the shore, is the *Friedera Shoal*, always covered, but the sea breaks on it when there is any swell from without the bay. The distance from the Cochinos to this shoal is 420 fathoms, and it lies with the church of the Carmelites bearing S. E. ½ S.

The Puercas, or Hogs, are a cluster of black rocks, extending E. by S. and W. by N. They are always distinguishable by the breakers at high water, and visible when it is low tide. The bearing and distance of these from the Cochinos are E. ½ S., nearly half a mile. *La Cruz Rock* is above water, the largest of a number lying close to the wall at the foot of the bastion of the Bonete, or westernmost bastion of Cadiz. *El Frayle*, or the Friar, is a rocky shoal, off the N. W. bastion of the town, behind which may be seen the Carmelite church before-mentioned. Its bearing and distance from the Puercas are S. E. 435 fathoms; the least depth over it is 14 feet. When on the east end of this shoal, the Carmelite church will be seen between the two sentry-boxes on the bastion of Candelaria;

and when on the west end, La Cruz rock will be in one with the tower of St. Sebastian.

The **El Diamante**, or The Diamond, is a rocky shoal, extending N. W. and S. E. about 165 fathoms, having over it 12 feet at low water; the mark for it being the flagstaff of the castle of Santa Catalina del Puerto on with the easternmost part of the Morro of Xeres. The northern part of Puerto Real will then be in a line with the southern little hill of Medina; and the Puercas in one with Fort St. Catharine. *La Galera*, another rocky shoal, extending from north to south, nearly 400 fathoms, lies at the distance of 412 fathoms from El Diamante. Its least depth appears to be 10 feet at low water; on the shoalest part the southernmost part of Puerto Real will be on with the first top of the Barrueco, a little hill, having two peaks on its summit; and the steeple of St. Domingo will be covered by the point of St. Philip, about a boat's length; Point St. Philip will then be in a line with the ditch of the Land-port of the city. Between Los Corrales and the castle of Puntales is the shoal bank of St. Domingo, on which is 8½ feet; the bottom is of sand and shells. The outer edge of this shoal forms the narrowest part of the harbour, and lies in a line with the castle of Puntales and Torre Gorda, or Tower of Hercules.

Directions for entering the Bay of Cadiz. Vessels coming from the westward will, as they approach Cadiz, observe inland a ridge of hills, having one among them higher and rounder than the rest; this is called the Moor's Head, and may be brought to bear E. ¾ S., which course will carry you direct to the tower of St. Sebastian and the buildings of Cadiz. As the lantern is 172 feet high from the base, it may be seen at the distance of between 4 and 5 leagues. Cadiz may distinctly be seen at 3 leagues off. In approaching towards the city, a good berth must be given to the rocks in its vicinity.

Vessels sailing into Cadiz Harbour, with a fair and leading wind, so soon as they are in the fairway between Rota and Cadiz, the leading mark is the church of Puerto Real in a line with the steeple of the church of Medina, bearing S. E. ½ E. This mark leads between the Puercas and the Diamante; but, so soon as you have proceeded so far in as to discover the Mole of the Seville gate of Cadiz open on the east of Point St. Philip, you may haul round and anchor, in 5 or 6 fathoms, with the castle of Santa Catalina N. N. E.; or in 3¼ or 4 fathoms, with the head of the lesser mole bearing west. But if wishing to run on beyond Cadiz, steer right for the castle of Matagorda, until the Torre Gorda, or Tower of Hercules, on the isle of Leon, opens on the east side of the castle of Puntales; then laying the ship's head towards Torre Gorda, to the entrance of the Narrows, where the north side of fort Luis and the south side of Matagorda castle are in a line, whence you stand on for a high tower on the north side of the town of Leon, and come to an anchor, with that tower bearing about S. by W. ½ W., in what depth you please, from 7 to 4 fathoms.

Should a heavy easterly or south-easterly wind, or the approach of night, or an ebb tide, prevent a vessel entering the bay, she may come to an anchor without the harbour-shoals, in 10 or 11 fathoms, muddy bottom. On taking this station, in the winter, it is necessary to have the light-tower of St. Sebastian to the S. S. E. (S. E.) half a point more or less, with the castle of Santa Catalina del Puerto, nearly E. ¼ N., in a line with the Morro of Xeres. In summer, you may come-to more to the N. E., as there is, in that season, no danger of sudden gales; and you will thus have the advantage of being a little to windward on the following morning; for, in the summer, in general, the wind draws away from the land in the morning, and so assists vessels in entering. Ships moor with due regard to the turn of the tides, having the best anchor to the eastward or S. E., as the winds from that quarter are the strongest winds that prevail here.

With a favourable wind, in fair weather, vessels may run in between the Cochino, Puercas, &c., and the shore of Cadiz, through a channel having a depth of from 15 to 24 feet. It should not, however, be attempted by any who are not well acquainted with this place, or unless in a case of absolute necessity. Vessels may also enter the harbour by passing to the northward of Galera ; if coming in this way, in a large ship, keep over to the sandy shore northward of the castle of Santa Catalina, or to the distance of half a mile from it, until that castle, nearly E. $\frac{1}{4}$ N., be in a line with the Morro of Xeres, whence you may run to the anchorage.

With an adverse wind, this bay should not be attempted without a pilot, if one can be obtained, as it is difficult for a stranger to ascertain the marks. It is, however, presumed that, with attention, the following instructions may be useful :—Should a vessel be off the point of St. Sebastian, with an easterly or south-easterly wind, she must give a good berth to the Olla, or Kettle, the shoal which lies off that point, and then bring the castle of Santa Catalina del Puerto in a line with the road leading to the town of Xeres, or with a break in the N. W. part of the Morro of Xeres. This bearing should be kept on, until the two towers of the Carmelite church in Cadiz, after having appeared in one are again open ; here you will have passed the Cochinos, and must haul up to the wind, standing more easterly towards the shore, provided the castle of Santa Catalina be open with the Morro of Xeres. In a ship of the line, if this be not the case, you should not stand on so far as to bring the town of Puerto Real open with Medina, but put about to the southward before that happens, in order to avoid the Diamante. A smaller ship may, however, keep on, if certain of making good way on the larboard tack ; or so that the Puercas be not brought in a line with the light-house of St. Sebastian, but kept open on the west side of them, before Puerto Real be brought in a line with Medina ; for if the last objects be kept in one, you may happen to touch on the Diamante. If standing in, on the larboard tack, before you clear the Cochinos, take care not to go so far as to bring the two towers of the Carmelite church in one, when the light-house of St. Sebastian bears S. S. W. (South) ; but so soon as the opening between these towers begins to close, put about on the the other tack, observing, at the same time, that the spire of the church of Puerto Real be on the break in the land, on the north side of Medina. On the next board you will run between the Puercas and Diamante, taking care not to bring, on either tack, Medina open with Puerto Real, until the steeple of St. Francis, in Port Santa Maria, appears on the east side of the castle of Santa Catalina, when you may continue the course towards that castle, as you will then be to windward of the Diamante. On subsequently standing to the southward, you must not separate Puerto Real from Medina, until the steeple of St. Domingo appears open of the point of St. Philip, in Cadiz, when you will have weathered the Frayle ; and may stand on, until the steeple of Puerto Real appears a little to the northward of Medina, when you will be within all the shoals, and may proceed to an anchorage, as already described.

It is high water in Cadiz bay at two o'clock, on the days of full and change, and the tide rises 10 feet ; on the next days following, it rises 11 ; but neap tides rise only six feet. In the space between the Frayle and the Cochinos, the ebb tide runs strongly through the channels between the shoals, and the flood tide, on the contrary, sets towards them.

From Cadiz to Cape Trafalgar the shore runs southerly, having many rocks which lie scattered about, and are extremely dangerous. In sailing round the Isle of Leon give the land a good berth, and keep the tower or light-house of St. Sebastian wide open of the town of Rota, or bring the lantern to bear N. N. E., by which you will clear the rocks which lie about S. $\frac{3}{4}$ E. from it, distant one mile. Further on, bearing S. S. W. (South), $2\frac{1}{5}$ miles from the light-house, is a shoal spot, with only 13 feet over it at low water. From this spot the Morro, or hill of Xeres, appears in a line with a remarkable church, having three towers, situate nearly half a mile to the southward of the land-port of Cadiz. To avoid it, keep the light-house of St. Sebastian a point or more to the eastward of N. N. E. The reefs to the southward will be avoided by taking care not to bring the light-house of St. Sebastian and the town of Rota in one, or rather by keeping Rota open to the left of the point of St. Sebastian.

The **Torre Gorda**, or Tower of Hercules, stands S. by E. $\frac{1}{4}$ E. (S. E. $\frac{3}{4}$ S.) from the light-house of St. Sebastian, distant 5 miles. The coast between, being a very low beach, with rocks along it, is called the Arecife, or Reef of Cadiz. The islet *Sanctri Petri*, lying at the entrance of the river which bears the same name, is $5\frac{1}{4}$ miles nearly south from the Torre Gorda. The coast, as above, is a low flat beach, with detached rocks and stones. The islet is surrounded with rocks, and has on it a castle with a square tower; within it the river has two entrances, but both are too much obstructed by rocks to admit of any vessels larger than fishing boats and small coasters. A round tower called Torre Bermeja, or the Red Tower, is S. E. by E. $\frac{1}{4}$ E. from Sanctri Petri, distant nearly 4 miles; it stands near the beach, at the east end of a portion of coast, of a red colour, level on the top, and steep towards the water, but a little higher than the land to the westward of it, and covered with fir trees. Another round tower, called Barrosa, stands on a height, at the distance of a mile and three-fifths to the southward from the former. The coast between is the flat beach of Barrosa. To the north-eastward of the tower is a little hill called La Cabeza del Puerco, (the Pig's Head), which serves to point out the position of several shoals hereabout.

Cape Roche, at $2\frac{1}{3}$ miles from the tower of Barrosa, has on it a square tower; this cape is not high, but steep to seaward, and of a red colour, by which it may readily be known. Some rocky precipices, near the cape, are called the Castelligos, or Little Castles. Close under the eastern side of Cape Roche is a small beach, with a little river. The eastern point of this flat beach, called Espileta, is rocky, and is useful as a mark for some of the shoals in the offing, hereafter described. The *Watch-tower of Conil*, which stands within the distance of one league S. E. $\frac{1}{4}$ S., is square, and stands on a height a little to the westward of the town of Conil. In the bight between these towers, at a mile from the latter, are the remains of a tower called Torre Blanca; and below this, close to the shore, are three large rocks, lying in a line athwart the land. The top of this coast is even, its face steep, and a little higher than Cape Roche, with a sandy beach, and a few rocky points. The little river of Conil admits small vessels at high water, but they lie dry when the tide is out. The tower of Castiloba is square, and stands at a mile and a half southward from that of Conil; the beach on which it is placed is very flat, but the interior land is hilly.

Cape Trafalgar is 5 miles to the southward of the tower of Castiloba, and is situate in latitude 36° 10′ 15″ N., and longitude 6° 1′ 30″ W. It is not high, but may be known by its remarkable figure, being flat, and terminating with two sharp corners, or angles. A round tower stands on the eastern corner. To the eastward of the flat, the land is very uneven and mountainous. East of the flat land are high sandy cliffs, but none to the westward. Between the cape and Castiloba the coast is all low and sandy, excepting a few rocky points, equally low with the rest, and of which one extends outward to the distance of more than a cable's length. *The Altos*, or *Heights of Meca*, to the north-eastward of Cape Trafalgar, are very level on the summit, and appear to be divided into two parts, spotted with green clumps, and a few patches of white sand. Three miles to the S. E. by E. ½ E. of Cape Trafalgar is the tower of Meca. Between is seen a patch of sand called the Boqueron, useful as a mark for the shoals in the offing. Nearly a mile, E. by. S. from the tower of Cape Trafalgar, the beach is low, and has a small creek, with some rocks lying before it; this is called the Barcadero of Meca, and here water may be obtained. Vessels may anchor off this place, in a convenient depth, on clear ground, from N. W., North, and N. E. winds..

SHOALS BETWEEN SANCTRI PETRI AND CAPE TRAFALGAR. The *Juan Vela* is a large rock, lying at the distance of 3 miles, W. ¼ S. from the castle of Sanctri Petri: the depth over it is 2½ fathoms.

The Haste Afuero, or the Outer Haste, lying 3 miles S. W. by W. from Sanctri Petri, and 5¼ miles from Cape Roche. It is a rocky shoal of 3 fathoms. Large ships should pass at considerable distance from, and smaller vessels should not come near this shoal, for the sea rolls heavily, and breaks over it with a swell.

The Marrajotes is a rocky shoal, about half a league in length, in a S. E. by S. and N. W. by N. direction, with from 2 to 4 fathoms upon it. Its N. W. point lies S. S. W., 2⅔ miles from Sanctri Petri, and N. W. 3¾ miles from Cape Roche. Its S. E. point lies S. ½ W., nearly 4 miles from Sanctri Petri, and N. W. by W., 2 miles, from Cape Roche. On the extremities are 4½ fathoms, and the sea generally breaks over them. To pass between this reef and the land, keep the town of Conil shut in with Cape Roche.

The Shoal of Cape Roche is a rocky shoal, having over it only 1½ fathom, at low water. It lies at the distance of a mile, W. by N. from Cape Roche.

The Shoal of Conil is another rocky shoal, lying at the distance of 1½ mile from shore, and its least depth appears to be two fathoms, varying to 4½ fathoms. Its north end lies with the look-out of Conil, N. E. ¼ N., distant 2¼ miles; and the tower of Castiloba, E. N. E. ¾ E., one mile and three-quarters.

Bank, off Cape Trafalgar. This bank extends 1½ mile, N. N. W. and S. S. E., and lies at the distance of between 3 and 4 miles from the Cape. Its least depth is 3 fathoms, but around it are from 8 to 10 fathoms, at a short distance. The N. W. end bears N. W. by W. ½ W., 3¾ miles from Cape Trafalgar; and here the tower on that cape appears in a line with the tower of Meca, while the tower on Cape Roche is in a line with the Cabeza del Puerco, before described. The S. W. end bears W. ¾ N., 2¾ miles from Cape Trafalgar, and S. S. W. from the tower of Conil. From this end the tower of Trafalgar appears in a line with the sandy spot called the Boqueron.

The Shoal of Aceytera is a reef of rocks, extending North and South, about one mile, and about two cables' length in breadth. The least depth is 1½ fathom at low water; but in the intervals between the rocks there is as much as 5 fathoms. The N. W. end lies W. N. W. ¾ W., nearly 2 miles from Cape Trafalgar; and the S. E. end, W. S. W. ¾ W., at about the same distance from that cape. On the north end the tower of Trafalgar is in one with the Boqueron; on its shoalest part the same tower is in a line with the highest point of the high land of Meca. Between the shoal of Aceytera and Cape Trafalgar, in an extent of half a mile, there seems to be a boiling in the water, with the appearance of breakers. This is merely the effect of the counter currents, there being no danger, and it is therefore called the *Riöa*, or Laughter of the Cape.

Directions. In passing without, or on the outside of these shoals, it will be sufficient to give the land, all along, an offing of one league and a half; and thus you may run along, with safety, in from 17 to 14 fathoms; due allowance must, of course, be made for westerly and south-westerly winds. Within the shoals there is a clear channel, of half a league in breadth, excepting off Cape Roche, where it does not exceed a mile ; any ship may use it, as the least depth, close to the shoals or land, is 5½ fathoms ; and in the middle the depth is generally from 11 to 9 fathoms; bottom, sand, gravel, and rock. If requisite to pass through this channel from the southward, the best way is to keep within half a mile of Cape Trafalgar, and about the same distance from shore, all the way thence to Sanctri Petri, where you must stand off, until you bring the light-tower of St. Sebastian N. E. by N., so as to avoid the reef already described, which lies 2⅕ miles, S. S. W. from St. Sebastian's point.

Having entered the channel, between the shoals and land, you may easily stand out to sea, should this be required; only taking care to observe the bearings of the land, and attending to the state of the tides, noting that the flood sets very strong to the north-westward, and the ebb in a contrary direction. During a heavy swell, with wind unsteady, it would be imprudent to attempt the passage between Cape Trafalgar and the shoal of Aceytera, as here the sea rolls deeply, and, should the wind fail, you may be obliged to come to an anchor in an exposed situation, and on bad ground.

Four miles and a half from Meca new tower is the Point of Sara ; between is the cove and river of Barbate, where there is clear anchorage, but the river is narrow and shallow. Sara point is moderately high near the sea, being the extremity of a mountain, having two towers, and other buildings on its summit. Cape Camarinhal is low, having a watch-tower erected on it, and rocks scattered about its point; it forms the east point of Sara bay, where, in moderate weather, small vessels may ride securely enough. Cape Plata is the extremity of another mountain, with several rocks about it.

PALOMA. Four miles and a half, S. E. ½ E., are the point and tower of Paloma, having several rocks before it ; between is the bay or cove of Balonia, where there is good anchorage half a cannon-shot from the shore. About 3¾ miles from Paloma point is that of La Pena, having a tower erected on it; between is the bay of Valdebaqueros, which affords shelter for small vessels. Four miles from La Pena is the chapel of St. Catalina, with the town of Tarifa, and about two-thirds of a mile further is the island of the same name. Tarifa is a small, low, and level island, distinguished by a light-house. The channel on the north side is only a cable's length in breadth, and has but a depth of 8 feet at low water; the water, however, outside, is deep. The Marroquina rock lies on the S. W. side, distant half a musket-shot from the shore, and is sometimes covered; there are some shallows also on the western side, but the island is otherwise clean all round.

The Cabezos Shoals lie with the light-house of Tarifa, bearing S. E. ¾ E. about 5 miles distant, and Paloma tower North; they are about a mile in length, stretching in a S. E. and N. W. direction, having only 2 feet over them at low water; but at a short distance are 2 and 3, and a little further on 8 and 10 fathoms. To avoid these dangers, bring the low sand hills to the eastward of Meca, by Cape Plata, taking care in standing to the northward that they do not become covered by the cape, until the chapel of Luz is open of the east end of the Sierre de Eumedia; but keep at a proper distance from the shore, as there is a rock lying between the Cabezos and Point Pena, named La Piedra de Valdebaqueros, having but 2 fathoms on it, and 4 to 6 fathoms near it; this rock lies W. S. W. from the tower of Pena, distant 1½ mile, and N. W. by N. from the island of Tarifa, distant 4 miles; between this rock and the tower on Pena point there is a channel above a mile broad, having in the middle 8 and 10 fathoms, sandy bottom; to sail through it bring Paloma point in one with Cape Plata. W. S. W. of the Cabezos, distant three-quarters of a mile, is a new bank of 7 or 8 fathoms, running W. N. W. ½ N. and E. S. E. ½ S.; and between these and the Cabezos are 11 and 7 fathoms. Westerly winds frequently form a whirlpool between it and the shore.

Half a mile N. W. of the Cabezos, and about 2½ miles from Point Paloma lies the shoal of Arroya del Puerco, a narrow ledge of rocks, about one mile in extent, with a depth over it of 3 fathoms, at three-quarters flood; between the shoal and the land are 14 to 18 fathoms, and between it and the western part of the Cabezos 8 to 12 fathoms. With westerly winds there is a whirlpool between this ledge and the land. THE THISBE ROCKS, on which H. M. frigate "THISBE" struck in August, 1804, is a reef lying S. by W. ½ W., distant about 5 miles from Paloma tower, and W. N. W. ½ W. 5½ miles from Tarifa island: it has only 14 feet water. Tarifa light-house E. ½ S. leads clear to the southward of this shoal. East of St. Catalina is Camorro point, which is high, broad, and steep, with rocks about it. Between the island and the town of Tarifa small vessels may be sheltered from westerly winds, and, in fine weather, large vessels may anchor to the eastward of the island, opposite the sea gate of the town, in from 15 to 18 fathoms.

Point Gualmesi lies nearly 5 miles to the eastward of Tarifa light-house, having a watch-tower on its summit, and a small cove on its eastern side; 2½ miles further is the east point of Azebuche. The land between these points bends in to the northward, and within it stands the castle of Tolmo, off which there is good anchorage for small vessels, and shelter from northerly winds, in from 8 to 6 fathoms, good holding ground. One mile beyond Point Azebuche is Point del Frayle, having also a watch-tower standing on the slope of a hill; close to the point is an islet which, in appearance, is said to resemble a friar, and has several rocks about it. On the east side of the point is a small sandy cove, fit only for small vessels, and sheltered from the north-westerly winds, with a castle for the defence of the anchorage. Cape Carnero, or Cabrita point, lies about two miles to the north-eastward of Punta Frayle; and within it, on the S. W., is Palomas, or Pigeon island, distant about three-quarters of a mile from the watch-tower of Point Carnero. The island is low and ragged; off its N.W. part are the two Cabrita islands, and 1½ cable's length further west is a cluster of small rocks, some above and others under water.

THE PEARL ROCK lies about 1½ mile to the southward of Palomas island; it has not more than 9 or 10 feet water on its shoalest part, but, at two ships' length from it, it is surrounded by 7 to 9 fathoms. The mark for the shoalest part is Pigeon or Palomas island in one with the third rising from Carnero point; a peaked rock, off the same point, in one with a hill like a sugar loaf, with a small saddle on the top of it, which stands to the eastward of St. Roque, and the tower on Point Frayle, W. N. W. The channel between this rock and Palomas island may be used with a leading wind, taking care to give the island a berth of 1½ cable's length; in this passage are 7, 8, and 9 fathoms water. In coming from the westward you will have passed the Pearl, when you perceive the town of St. Roque (which is readily known, being seated on the top of a small hill) over the rocks of Carnero point, or when that point bears N. by E. you may run in for the bay of Gibraltar, giving the larboard land a good berth, until you open the Devil's tower, towards which you may steer and anchor in any depth from 20 to 5 fathoms.

SECTION II.

ISLANDS OF THE ATLANTIC.

THE AZORES, OR WESTERN ISLANDS, are situated between the latitude of 39° 45′ and 36° 57′ N., and longitude 31° 10′ and 24° 55′ W. They consist of nine islands, in three distinct groups, lying in the direction of W. N. W. and E. S. E., and extending about 330 miles. The north-western group contains the small islands of Corvo and Flores, distant about 114 miles from the central group, which includes Terceira, St. George, Pico, Fayal, and Graciosa. The third group, 69 miles to the S. E. of the second, is composed of the two islands of St. Michael and St. Mary, and the Formigas rocks. Doubts still exist with regard to a small island seen by Pimento, the Portugese navigator, who calls it Topo: is is supposed to be about 4 miles north of the S. E. point of St. George (Ponto de Topo) and to be about 7 or 8 miles in circumference. This island is not generally laid down in the charts, but is said to have been seen by an English ship of late years. The general character of the islands is mountainous, of a conical form, and great bulk; the most remarkable among them is the Peak of Pico, whose small sugar-loaf on its summit is so very regular as to appear the work of art. In clear weather this island can be seen upwards of 20 leagues.

On approaching the islands the aspect is unpromising, from the barren appearance of the mountains, and the steep rocky coasts, which nearly everywhere present high and craggy cliffs; but a nearer view exhibits a most luxuriant landscape of vineyards and corn-fields, interspersed with orange and lemon orchards, and open pastures bounded by woods. ST. MICHAEL is the largest island, and the residence of the bishop; but ANGRA, in TERCEIRA, is considered the capital of the group, and the seat of the civil government. Among all the Azores there is not one good port for vessels of burthen, all the anchorages being in open bays or roads, from which ships are often obliged to put to sea at a very short notice. The CHANNELS among the islands are clear and deep, but strong currents set through them, and the Florida or Gulf Stream is at times sensibly felt here. From the nature of the land, vessels are subject to sudden calms, squalls, and eddy winds, by approaching too close to the shore.

The trade of the Azores was formerly a monopoly of Portugal, but it has been thrown open to other countries, whence woollens, hardware, boards, staves, pitch, tar, iron, &c., are imported; in return for which wine and fruits are the chief payments. From the mother country the payment of its imports consisted principally in dispensations, indulgences, images of saints, sacred relics, &c.

The climate is mild and pure. The winter, though attended with heavy storms, is not severe, nor are the heats of summer oppressive, surrounded as these islands are by such an expanse of ocean. The Portugese settlers naturally introduced their own religion, manners, and customs, which their almost undisturbed possession, and a similarity of climate to that of their own country have contributed to maintain. Regularly built towns, handsome churches, large convents and monasteries, and the prevalence of whitewashing their buildings, are the same features as are found in Portugal. The population of the islands is computed to be under 200,000 souls.

Corvo. This island is the north-westernmost of the Azores; it is of moderate height, intersected with hills, and may be seen, in clear weather, about 10 or 12 leagues: there is a mountain at each extremity of the island, which gives it the appearance of a saddle, when approaching it from N.W. or S. E. The north coast is high and steep, having no symptom of cultivation; about midway there is a rock, a cable's length from the shore, over which the sea breaks; the eastern side is also high, declining towards the sea; the western side is of a similar description.

About half-way down the western side is Point Blanca, and upwards of one mile and a half from that is the low rocky point of Pesquiero Alto, being the south point of the island; the coast between forms a bay, in which is a small beach, connected to a high islet; the anchorage is in 30 fathoms, well sheltered from easterly winds, bottom of sand, which holds well. A mile and a quarter, E. ¾ S., from Pesquiero Alto is Point Puerto Casa, on the north side of which there is good anchorage in 25 to 30 fathoms. The Channel between Corvo and Flores is very deep, and is quite free of shoals or any dangers whatever.

Flores. Point Albernas is the N. W. point of Flores; it is of a red colour, moderately high, and gradually sloping towards the sea; the coast to the eastward of it, as far as Point del Gada, is entirely surrounded with rocks, and affords no anchorage; the latter point is high level land, projecting but little, and having a cluster of islets at its base, extending a quarter of a mile, with clear water around them. The north-east end of Flores is named Point Ruiva, near to which is the islet of Azacar, or Sugar-loaf, and westward of it is anchorage in 25 fathoms, well sheltered from S. E. to S., and thence to W. S. W. Nearly 3 miles, S. ¾ E. (S. S. E. ½ E.) from Point Ruiva is Santa Cruz point, having the small island of Alvaro Rodriguez between, with anchorage to the S. E. of it, in 35 or 36 fathoms.

Three-quarters of a mile to the south of the point is the Castle of Santa Cruz, near to which is the town of the same name, and the principal port of the island. One mile and three-quarters from the castle is Point Cabeira, low and rocky land, rising with a gentle acclivity to the distance of a mile. Between these points the coast forms a bay, with a beach and small river at the bottom of it. Here there is good anchorage in 35 to 40 fathoms, sandy ground, well sheltered from all points between N. N. E. by the West, to S. W. Loma is a high oblique point, distant 1½ mile, S. W. ½ W. (S. S. W. ¾ W.) from that of Cabeira; there is a bay between, where a vessel may anchor in 25 fathoms, but it is not so well sheltered as that just described, being open to easterly and southerly winds. Four miles further is Point Lagens, from which a ridge of rocks extends to the distance of a cable and a half, S. S. E. In the bay, on the north side of this point, is situated the town of Lagens, having a large church, that serves as a useful mark for the coast; the anchorage is in 25 fathoms, sandy ground. At 2½ miles, S. ½ W. (S. by E. ¼ E.) from Lagens point is a rock of 4½ fathoms, which appears like a large flagstone when near it: the water around it is very deep, as well as the channel between it and the shore. The coast increases in height to the westward of Lagens' point, as far as Roca Alta, to the north of which is the highest land of the island.

Between Roca Alta and Point Ilheos, the S. W. extremity, there is a bay, with anchoring ground in 25 fathoms, sandy bottom. Point Ilheos is low and rocky, having several islets near its base; more than a mile to the northward is Point Catarinas, distinguished also by some small islets; and 1¾ mile further is Point Bredos, a high sloping land, of a whitish appearance, near which is an islet in the form of a column, with others near it; between the last named point and the former, there is anchorage in 20 to 25 fathoms, sandy bottom. Between Point Baxio, or Shoal point, which is 2¾ miles to the northward, and Point Bredos, a vessel may anchor in 30 fathoms, and lie well sheltered towards the N. N. E., East, and South. Baxio point is distinguished by the remarkable church of St. Pedro, or St. Peter. Point Fanaes lies 2¼ miles in a N. N. E. direction, having the appearance of a mountain of a black colour. The bay between is that of San Pedro, which has anchorage in 24 to 30 fathoms, sandy ground, and where abundance of fresh water may easily be procured from a cascade which falls from the mountains. N. W. ¾ W. (W. N. W. ½ W.) from Point Fanaes is Monchique islet, separated from the shore by a deep channel; further on towards Albernas Point, already described, is that of Maria Gadella, a high round islet, having anchorage W. ¾ N. (W. by S.) from it in 30 to 40 fathoms, sandy bottom.

Mr. E. May, master of H. M. P. Skylark, says, "At daylight bore up for the bay of Fanaes; at 5h. 30m. shortened sail and sent a boat for water. Found a great surf on the beach, which consists of large stones, none smaller than a man's head. These stones extend from the beach two or three boats' lengths, making it dangerous for boats to land."

"The best landing place is a passage between a point of rocks that lies to the south of the beach; from thence you may procure water from a fountain, about half a mile from the beach, employing small casks, and at the rate of 3 to 5 tons per day by employing natives, if the weather is fine, and the wind between S. S. E. and N. E. With any other wind, particularly if blowing hard, there would be too much surf, and the passage too narrow in such weather to enter. This place may be known by a very high and steep mountain, a little to the left of the landing place, from whence the island Monchique bears N. W., one mile and a half. Between this island and the shore is a clear passage for any ship; but she should borrow towards the rock, as a reef projects about a cable's length from them, although there are no hidden dangers in the passage."

"At this place, by the assistance of shore boats, about 4 tons of water were obtained in 10 hours. The place abounds in poultry, sheep, pigs, vegetables of all kinds, and eggs, all very cheap, and were freely exchanged, by the natives, for old clothes. Those who came off to the ship were well dressed, clean, healthy people. The shore of the island is bold, and may be approached to the distance of a quarter of a mile. Leaving Fanaes, I would recommend vessels to run due west, for two or three miles, to get clear of the high land to the northward of the landing place, by which they would avoid being becalmed under this land when the wind is from N. E. to S. E., and would be enabled to run clear of the island. Corvo has also a bold shore, and can be seen off deck 55 miles distant, as was proved by us the day after leaving the island, both by log and observation."—*Nautical Magazine for* 1842, *page* 153.

ISLAND OF FAYAL. The chief town of Fayal is named ORTA, situated near the S. E. point of the island, where stands the hermitage of Nuestra Senora de la Guia, to the west of which is the small sandy cove of Port Pin, where small vessels often discharge and load in fine weather, as it is well sheltered, except from the S. W. point. N. E. ½ E. (N. N.

E. ½ E.) one mile and three-quarters from La Guia, is the northern point of Orta bay, named Espalamaca; here commences a beach of black sand, which terminates at Mount Caimada. Orta is distinguished by two remarkable buildings, which bear in a line nearly N. N. W.; one of them is called the Company's college, and stands near the sea side; the other, the Carmelite convent, is situate in the west end of the town: the safest method of anchorage is to bring the former building a little to the southward of the latter, with Point Joao Diaz (hereafter noticed) open a little to the right of Point Espalamaca; you will then be distant about a mile and a quarter from the town, in 35 to 40 fathoms, bottom of sand. The more general anchorage, however, in fine weather, is nearer the town, in 25 fathoms, with the buildings in the same direction; or for smaller vessels further in, to 20, 18, 16, and 15 fathoms. This anchorage, although perhaps the best in the Azores, is, notwithstanding, much exposed both from the North to N. E., and S. E. to S. W., and winds from those quarters are often frequent in winter; that from the S. E. blows right in, and is often destructive, it is therefore advisable to be always ready for a start when occasion requires.

There is a shoal of 3½ fathoms, lying nearly in mid-channel, between Fayal and Pico; it extends in a N. E. and S. W. (N. N. E. and S. S. W.) direction about 20 fathoms, and is about 10 fathoms broad; it lies with the college and convent in one, Point Espalamaca bearing N. by E. (N. by W.) and La Guia hermitage N. W. ¼ N. (N. W. by W. ¾ W.) Vessels coming from the S. W. sail between it and the latter, or should circumstances require it, the channel to the eastward, or between the shoal and Pico, is equally safe. In approaching the road from the S. W., should the wind be dying away from the eastward, and you intend to tack to gain the anchorage, keep within 1½ mile towards Pico, for further out the bottom is rocky and will prevent your anchoring, should you require to do so; you will also thus be free of the variable eddy winds and calms, caused by the neighbouring mountains.

Espalamaca is a high sloping point, having a small round front, with a vigia, or look-out, on its summit; about seven-eighths of a mile to the northward, is Point Joao Diaz, which is low, black, and rocky, with some rocks at its extremity; the coast between is indented, and has a beach with a church at the bottom of it, where vessels from port Magdalena, on the opposite side, sometimes take shelter during violent gales from the southward. About 2¼ miles, N. E. by N. (N. by E.) from Joao Diaz is the N. E. point of Fayal, named RIVEIRINA, which is high and sloping, forming a round front of half a mile; at its extremity there is a low point with three small islets: the coast between Joao Diaz and Riveirina forms a slender bay; the land is high and oblique, and presents, near the middle, a remarkable slope of a red colour, which may be seen from the mid-channel shoal. JORGE LORENZO is the northern point of Fayal, and presents a high sloping appearance. On the west side of the island are the Capelinos, two islets separated from the coast by a narrow channel, through which fishing boats may pass in fine weather. The S. W. extremity of Fayal is Point Castelo Blanco, appearing like an island at a distance, being sloped on all sides; the coast hereabout is rocky to Santa Catalina, which is a low black point, having a hermitage; between it and Guia point, distant 3¾ miles, is the cove of Feteira, where there is a small village and several islets.

With respect to Fayal it may further be observed, that, although the peak on the adjacent island is a conspicuous object, and may be seen, as we have already noticed, at a very considerable distance, yet, it is not always to be depended upon, being occasionally hid for days successively, in cloudy weather.

PICO. This island lies to the eastward of Fayal, being divided by a channel, which we have previously noticed, and to which we again beg to call the reader's attention; a plan thereof is inserted on the chart, which is also deserving of notice, and a view of the peak is given in our particular chart of the Azores; the island takes its name from this remarkable object, whose summit is 1172 fathoms high.

The S. W. and West coast of Pico is rocky, distinguished by several rocky islets; towards the N. W. extremity are the Magdalena islands, surrounded by rocks, with 6 to 8 fathoms water near them; here there is a small port and town, where the chief business between the island and Fayal is carried on. Further to the N. W. is Point de los Baxios, from whence breakers extend nearly a league in a gale; from this point, to the east end, the coast is so rugged as to be almost inaccessible. Point Isla is the S. E. extremity of the island; it is low and sloping, having a ridge extending to the eastward nearly a cable's length. Five miles to the eastward is Point Caleta, between which are the small harbours of Manana and Nesquin, only fit for small craft. The coast continues rocky to Point Arrife, which is distant nearly 7 miles; 2½ miles further is the town and lagoon of Lagens, joined to the sea by means of a bar, over which coasters pass at high water. Five miles and a half from Lagens is Point Catalina; N. E. of which there is a place of shelter for fishermen.

ST. GEORGE, OR ST. JORGE, is separated from Pico by a safe channel, 3 leagues wide. It is a long narrow island about 9 leagues in length, while its average breadth does not exceed one. Off Point Rosales, the west end of the island, are two high pyramidal islets, one at the foot of the point, and the other half a mile S. W. of it. Some other islets lie interspersed about it, and a rocky shoal of 7 fathoms is said to lie S. W. of the same point. From hence the coast trends S. E. by S. (S. E. by E.) to the Morro Grande, or High Hill, situate near the town of Velas, which has a port well sheltered for small vessels; to the N. W. of the Morro there is an indent of the coast, which has sometimes been taken for the port, and has, in consequence, proved fatal to many; the bottom is all rocky, and a vessel once in cannot leave, without a change of wind.

Point la Camaida is a low point, with a small castle, distant about 1½ mile from the Morro Grande, which is distinguished by a vigia, or look-out, on its summit; between the two points is the port of Velas, which, as we have just stated, is well sheltered from most winds. The town is situated at the bottom of the bay, and has a small mole on the S. E. side, within which are 3 fathoms, rocky ground; the common anchorage is therefore in 9 fathoms, sandy bottom, south of the mole, moored with two anchors N. W. and S. E.. To the eastward of Caimada point the coast continues low and rocky all the way to Point Montros, the S. E. extremity of the island; in the interval between, about 4 leagues from Velas, is the point and town of Caleta, where a high mountain rises, and indeed the land in the interior is generally of moderate height, although the coast is low. The easternmost point is named Topo, around which, as well as the islet to the eastward of it, are numerous rocks. From Point Topo to Point del Norte Grande, the coast presents nothing remarkable, but has a low, regular appearance; from the latter point, however, to that of Rosales it is more rugged and barren.

GRACIOSA. This island, though comparatively small, is considered the most fertile of the Azores, and supplies many of the others with part of its produce; wood, however, is scarce, and is often imported from Pico, or

St. George's. Point Pico Negro is the north point of the island; it is high, oblique, and of a black colour; the coast to the S. W. to Point Pico is high and rocky; half a mile, S. W. by S., from the latter, is the low rocky point of Jorge Gomez, distinguished by a church near to it; 3¾ miles further is Point Blanca, in the interval lies Point Frayle, rendered remarkable by having a stone on its summit resembling a man. At S. E. ¼ S. (S. E. by E. ¾ E.) 2¼ miles from Point Blanca is the point and town of Folgo, situated in a bay between. We now reach Carapacho, the S. E. point, which stands low towards the sea, though it is high and craggy at a short distance inland. Several islets lie hereabout; that named Abajo, is distant about two cables' length from the point, being divided by a safe channel, through which, if necessary, a large ship may pass. With the islet in a line, or a little open of the west end of Praya island, hereafter noticed, there is good anchorage in 30 to 40 fathoms, well sheltered to the westward; this is off the southern extremity of a great slope of land, that extends towards the point of Josef Ferrer, and where vessels commonly load and unload their cargoes.

The coast between Carapacho and Point Fanaes, lying 1½ mile N.E.¾ N. (N. 14° E.) is clean and regular; and 1½ mile, N. ½ E. (N. 15° W.) from the latter is the low rocky point of Negra; between is the bay and town of Praya, with an island of the same name, lying half a mile East of Point Negra; there is a passage between, and a cable and a half to the southward of the islet is the anchorage. Three miles North (N. N. W.) from Point Negra is the point of Josef Ferrer, so low as to be even with the water, and having a dangerous shoal about a cable's length to the eastward. On the west side of the point is SANTA CRUZ, the chief town of the island, distinguished by three churches, on three small hills near each other, and so conspicuous as to serve as a good mark for the north side of Graciosa.

TERCEIRA. ANGRA is the chief city of the Azores, and stands on the south side of Terceira island; it is easily known by the remarkable forked hill on the west side, named Mount Brazil, at the foot of which are the strong forts of St. Juan and St. Antonio; the Cabras, or Goat islands, which lie about 4 miles to the eastward of the mount, will also serve to recognise it. Ships should moor in a line with the forts of Antonio and St. Sebastian, which is on the opposite, or N. E. side of the bay; this is necessary as it is open to all winds, from S. S. W. by the South to East, and therefore unsafe when it blows from those quarters, particularly from the S. W., which causes a tremendous swell. Larger ships anchor to the eastward of Mount Brazil, in 30 to 40 fathoms, sandy bottom; but it is necessary to be always ready to start in case of necessity. On the west side of the fort of St. Sebastian is a sandy beach, called Puerta da Pipas, a place of shelter for small craft, in case they should be prevented by the sea from landing at the mole.

Vessels approaching the bay of Angra from the S. W., South, or S. E., should steer directly for Mount Brazil; and, with adverse winds, may tack boldly without the bay, as the water is sufficiently deep up to the shore: a calm, however, is to be dreaded, as the currents are strong and variable; we would not therefore recommend too near an approach, under such circumstances, as it is an iron-bound coast, and a ship driven on it would be placed in extreme hazard.

THE CABRAS, OR GOAT ISLANDS, already noticed, lie S. E. by E. (E. by S.) 4 miles from Mount Brazil; they consist of two islets, the eastern one being higher and larger than the other, and are separated from the coast by a channel of 10 to 13 fathoms. About two miles to the south-eastward of these islets is another, called Los Frayles, or Friars, having two pyramidal peaks: a shoal extends from the S. E. side of it, about a cable's length, over which the sea breaks; it is separated from the Goat islands by a clear channel of upwards of 70 fathoms water.

PORT PRAYA is a large safe bay, on the east side of Terceira, in which is situated a populous town of the same name, well defended by batteries. The bay is quite exposed to the eastward, though it is well sheltered from other points; the safest anchorage is with the north point (Malmaranda) in a line with an islet off its N. E. extremity, and the highest steeple, which is the northernmost, open to the west: here is depth of 24 or 25 fathoms, sandy ground, or you may approach nearer the shore to 16 fathoms. The best landing place is near the castle. The EASTERN COAST of Terceira is in general broken, rocky, and dangerous. Malmaranda is the easternmost point; it is high, and oblique, having a shoal near to it that shows itself at low water. The NORTH and WEST COASTS are equally inaccessible, and should not be approached by a stranger; near the S. W. point is a small but remarkable mountain, called St. Barbara, with a vigia, or look-out, on its summit. The western side is also distinguished by a rugged mountain, called Pico de la Serrata, known by a great break on its eastern side.

ST. MICHAEL. The westernmost point of St. Michael is that of Ferraria, which is high and sloping, terminating in a rocky ridge, which extends a league to the S. W.; here is a depth of 8 to 10 fathoms, with a heavy sea rising over it. To the N. E. is the little harbour of Mosteiros, with some remarkable islets near it; the largest is high, sloped, and smooth at its summit, with an aperture, through which the sea passes, from one side to the other. Between Point Mosteiros and Point da Bretanha is the bay of Joam Bom; the coast hereabout is high and rocky, and is further distinguished by a sharp point, called the Peak of Maffa. We now reach Ribeira Grande, a rich town, but there is no anchorage, or harbour, nor even landing, except when the sea is very smooth.* From hence to the N. E. extremity, Point Riviera, there is no place of consequence. On the east side is the small port of Arnel, but it affords indifferent shelter, and the ground is bad.

VILLA FRANCA, on the south side of St. Michael, is situated on a beach, which forms a very small bight. The channel between the islet Ilheo and coast is of the width of three cables' length, and is its principal anchorage; it has 10 and 11 fathoms of water, sandy bottom, and vessels moor North and South, with a hawser on shore, on the islet; but the latter, owing to its diminutive size, does not shelter a vessel from the wind and sea, between E. S. E. by South, to S. S. W. The Ilheo, is a remarkable volcanic rock, having a circular basin in its centre, with an entrance to it fronting the town: small vessels often enter here to careen, or take shelter in a gale; but it seems, from recent information, to be filling up with sand.

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* PORT OF CAPELLAS. Persons having stated that the bottom on the north side of St. Michael is foul in the anchoring depths, and that no vessel would be likely to recover her anchor if she brought up there, I thought it my duty to take the earliest opportunity of proceeding thither, with the Agent for Lloyd's at this port, for the purpose of ascertaining the truth of these assertions.

The result of our survey was, that, at about half a mile distant from the shore, between Ribiera Grande and Capellas, there is a line, which, with occasional projections towards the land, separates the foul and stony bottom of the coast from a perfectly smooth and firm bed of fine sand, sloping to seaward; that along this line the depth varies from 25 to 35 fathoms, and that, from the rugged nature of the coast itself, the small port of Capellas is the only part at which it would be safe for boats to disembark.

T. C. HUNT.

British Consulate, St. Michael, 24th Dec., 1841.

The City of St. Michael's, or Ponta del Gada, stands to the westward of Villa Franca, and though it has but an open roadstead for large ships to ride in, yet it is well sheltered, except during gales from W. N. W. to E. S. E. There is a mole for the protection of small vessels. Should you be forced to quit the anthorage, in a southerly gale, it will at all times be more prudent to round the west end of the island, than run to the southward, as a N. W. wind will commonly follow that from the opposite quarter. In beating up you may keep close in shore, avoiding only the rocks that lie off Point Galera, which lies on the east side, and is distinguished by a light-house, hereafter described.

The city of Ponta del Gada is distinguished by a light-house, at the top of the cathedral steeple, at an elevation of 110 feet above the surface of the sea, lighted with eight gas lamps and reflectors. On Point Galera there is another light-house erected, bearing S. E. by E. from the cathedral lights, distant 9 miles; and on a peak, situated at the S. W. quarter of the island, near Point Ferreira, is a third light-house. These lights are shewn every night throughout the year, from half an hour after sunset to half an hour before sunrise. They are, however, we are informed, but poorly illuminated, and cannot be seen upwards of 2 or 3 leagues.

The Coasts of St. Michael are all bold, and may be approached without fear, as all the dangers lie within a furlong of the shore, with the exception of those half a mile from the bay of Mosteiros, and those already noticed. Approaching from the westward, the N. W. end of the island has an unpromising appearance, as it presents but barren mountains of stupendous bulk, with a steep barren coast, surmounted by a few trees of slender growth. Approaching from the eastward, for the city of St. Michael, take care to give Point Galera a good offing, not only on account of the rocks, which have before been mentioned, but the high land behind often occasions a calm thereabout. During the winter months heavy squalls are often frequent, from S. W. to N. W., more particularly from the latter quarter.

ISLAND OF ST. MARY. The north side of St. Mary's affords neither shelter nor anchorage; its N. E. point is that of Lagoenas, which has an islet of the same name off it; this appears high and sloped, like a mitre, and when seen in an east and west direction, exhibits a small level point extending a little way into the sea; the passage between the island and the shore is obstructed by a rock, that lies in the midway. Port St. Lorenzo is formed by a high islet of that name, and Point Matos, distant one mile to the northward: here there is anchorage in 20 fathoms, sandy bottom, and water is easily procured by making pits in the beach. This place is distinguished by a church with several houses around it.

Point Cedros is distant 4¾ miles, S. by E. (S. E. by S.) from Point Matos, and 2½ miles further is that of Castelo, the S. E. point of the island; between these is a small point, off which is a rock, called Baja de Malla, separated from the coast by a clear passage 3 or 4 cables' wide, with a depth of 12 fathoms in mid-channel. Point Castelo is high, with a break that forms in a peak like a sentry box: a vessel may anchor with the point bearing S. W. by S. (S. by W.) in 10 fathoms, sandy bottom.

The town of St. Mary's is on the south side of the island, towards the west, on a bay in which there is a small island; the anchorage is between this and the shore, in 5 and 6 fathoms. The bottom is mostly sandy, but towards the western side there are some rocky parts: the road is open, and exposed to southerly gales, and is, consequently, chiefly resorted to by small vessels, and that in the summer season. The coast from Point Marban, the easternmost of the bay, to Point Pedrera is very regular, and is called Figueral, on the top of which is a rugged, though not a very high mountain. Further to the eastward is Malbasca point, distant about 2 miles from Point Castelo; here there is good anchorage, about a mile from the coast, in a line with Point Malbasca, and the castle, at the S. W. part of the town of St. Mary's, entirely open of Marban point; you will lie in 36 fathoms, sandy bottom, to the eastward of which the ground is foul. The west side of St. Mary's island is low, level, and uniform; the eastern side is higher and more broken, having several peaks and mountains, the most elevated of which is that called the Pico Alto, or High Peak. The coasts in general are clear, bold, and may be approached with safety.

THE FORMIGAS, OR ANTS, to the north-eastward of St. Mary's, together with the *Tulloch Rocks*, will be included in a following section. It may here be sufficient to observe, that they consist of a group of seven or eight rocks, extending about three-quarters of a mile N. N. E. and S. S. W.; and between them and St. Mary's no bottom was found at a depth of 120 fathoms, until within a quarter of a mile of the island.

TIDES. It is high water at St. Michael's, on the full and change of the moon, at 12h. 30m.; springs rise 7 feet. The tide is regular, and the flood sets to the eastward. In the offing it continues three hours later than on the shore. It is high water at Angra, at 11h. 45m.; springs rise 6 feet: at Fayal, 11h. 30m.; springs 4½ feet. The VARIATION at St. Michael's is 25° W.; at Flores 18½° W.

EXTRACT OF A LETTER FROM THE BRITISH CONSUL AT THE AZORES, RELATIVE TO THE COURSES OF GALES OF WIND AT THOSE ISLANDS.—*Nautical Magazine, for* 1842, *page* 145.

"The regularity with which gales enter these seas in the N. W. quarter, and after crossing them disappear at the S. E., is a circumstance, the knowledge of which may be serviceable to the commanders of ships sailing across the Atlantic."

"It seems highly probable, that if a ship were overtaken by a gale of wind in the current of the gulf stream, near the Azores, (for the storms appear to be guided by this current), she could sooner be extricated from it by steering due north or south, than by any other course; that if she went to the eastward she would accompany the gale, and be overtaken by the greater violence of its centre; and that in steering to the westward she would run through the whole gale, and perhaps be immediately afterwards caught in a new one."

"Another suggestion occurs to me, which I offer with great diffidence, as it is founded on the observation of one set of instruments, without that confirmation which would be so desirable from the other islands, but which is deserving investigation. The centre of a gale, in its approach, always effects a descent on the barometer, and a change in the fall of rain. In its actual passage over the instrument, the descent generally reaches 28.50, from which a rise of one-tenth appears to take place for every ten miles' removal of the centre; so that the number of miles distance from the centre of an approaching gale, might perhaps be indicated by the number of hundredths shewn by the barometer over the extreme of 28.50."

"The difference in the fall of rain, also, has its regularity; the approach of the centre, bringing a temporary increase, and then a cessation of the rain, which is renewed, and in a reversed order diminished on the removal of the centre. According to the observations made at this office, there appears to be in every gale of wind, a zone of rain, about 120 miles in breadth, heaviest on the inner edge, which is about 60 miles distant from the centre; that the fall decreases in proportion to the distance from this line; and that the fall on the inner edge being about twelve-hundredths of an inch per hour, the decrease is about one-hundredth for every 10 miles of removal from that line."

The descent of the barometer, and the heaviness of the rain, would therefore give the commanders of ships pretty accurate indications of the proximity of the most dangerous part of the gale of wind.

The courses of storms having been traced by Colonel Reid, in his recent work on the subject, from the tropics to the fortieth degree of north latitude, with their courses pointing towards the Azores, it was desirable to know if these courses were not continued across the Atlantic, and if the frequency and violence of gales of wind in the Azores were not due to a tropical origin. With this view, regular daily tables of the direction and force of winds have been kept by the British Vice Consuls, since the month of May, 1840; from which has been compiled the following table of the courses of twenty gales of wind, which have blown across the Azores since that time. An account has been kept of other gales, but it has been found impossible, from their crossing and neutralising each other, to trace them correctly, and they have, therefore, not been admitted into the present report.

The first gale which comes under consideration is, the minor one of the 4th and 5th of June, 1840. This gale was felt simultaneously at Flores and Terceira, but with less violence at the latter than the former place. It was not felt at St. Michael's, until (4th, 19 h.) 7 P. M. on the 4th, 13 hours after its touching Terceira. The distance from the first known point of its course to Terceira, which is 300 miles, may therefore be considered half the diameter of its circle.

The second gale took a course so far to the northward of the islands, that little of it could be traced. On the 19th, it did not reach St. Mary's, although felt at St. Michael's, which would indicate that the half diameter of its circle was 400 miles.

The third gale took a course directly across the Azores. It ceased to be felt at Flores, on the evening of the 5th, when it was blowing with great violence at St. Michael's, over which the centre passed that day. The half diameter of its circle would, therefore, be about the distance from Flores to St. Michael's, or about 360 miles.

The fourth gale came from a more northerly direction, and was felt at Flores. Its greatest force was experienced at St. Michael's and St. Mary's, from their greater proximity to the centre. It was not felt at Terceira on the 8th, so that its half diameter was perhaps the distance from that island, to the point of its course, on the morning of the 8th, or 440 miles.

The fifth gale was first felt on the 9th, at Fayal and Terceira, probably before daylight. On the morning of that day, its violence was as great at St. Michael's as at the other isle. This circumstance renders it probable that its half diameter did not exceed 300 miles. From which fact, connected with the greater velocity of its onward progress, the conclusion arises, that the velocity of a gale, in the progress of its centre, is in an inverse ratio to its diameter.

The sixth gale was felt at Flores with violence, characteristic of the storms experienced near that island, but which became less as the gale receded. It followed the ordinary inclination towards the S. E. of the Azores, until the morning of the 5th, when it was suddenly deflected to the westward, running a zigzag course until the morning of the 9th, and then continuing its original inclination to the S. E. The cause of this irregular deviation it is difficult to divine. It can be scarcely attributed to the resistance of another gale, as the rotary motion of winds in these latitudes, on their polar side from east to west, and therefore not opposed to gales tending to the eastward; and as (to be shown hereafter) the storms which pass over the Azores never return toward the north and west. This gale was felt at Flores until the 10th, when it was succeeded by the first indications of another. This circumstance would make the half diameter of its circle (as in the case of the third gale) the distance from St. Michael's to Flores, or 340 miles.

The seventh gale was felt at Flores on the 11th, and ceased to be felt there on the evening of the 12th. According to this circumstance, the half diameter would appear to be the distance of the gale's centre, at 3 P. M. on the 12th, to Flores, or 300 miles. The progressive velocity of this gale was greater than usual, being 12 miles an hour. This diminished diameter also accounts for the gale's disappearance from the Azores, after the evening of the 12th.

The eighth gale commenced with the usual violence at Flores, where it was felt until the 17th, when a change took place in the wind, indicating the departure of the gale. It was not felt at Fayal after the 19th, and its half diameter may be therefore stated at the distance of its centre, on the the 17th, from Flores, or, on the 19th, from Fayal. This is about 400 miles.

The ninth gale is one of those, the courses of which are disturbed by some unknown cause. In this case, it is not unlikely to have been its union with the vortex of another gale, from a more northerly direction,—a supposition which might be strengthened by the fact, that after its deflection, on the morning of the 1st, it was given a degree of rotary force which it had not shown in the previous parts of its course. Its progressive speed was also diminished, and did not again increase until, on the 2nd, it resumed its previous direction. This gale was not felt at Terceira on the 3rd, and its half diameter may, therefore, be estimated at the distance of its centre from the island, on that day, or 360 miles.

The tenth gale set in on the 6th, coming from a north-westerly direction,—continued a south-easterly course until the 9th, and was then diverted, during 24 hours, without any change in its course, until the 11th, when it returned to its first direction. It was not felt at Flores on the 9th, and therefore its half diameter was probably 330 miles. The progressive velocity of this gale was also lessened by the same cause which deflected it from its first course.

The eleventh gale was very much disturbed after its first appearance at Flores, from which it, on the 12th, was turned to the south and west. Here, on the 13th, it was met by, and received its force from a westerly gale, also of much greater progressive velocity. On the 14th, it suffered another deflection during 24 hours, with a diminution of its progressive velocity; after which it again took its original direction towards the east. This gale was not felt at Flores on the evening of the 14th, and its half diameter was therefore probably 280 miles.

The twelfth gale was first felt with but moderate force at Flores, on the 4th of December, which did not increase until the 16th. On the morning of that day, it suffered a deflection from a more northerly direction, which increased its rotary force, without affecting its progressive velocity. On the evening of the 16th, it ceased to be felt at Flores, so that its half diameter may be taken at the distance of its centre, at that time, at Flores. or 280 miles.

The thirteenth gale was one of great progressive velocity, moving, on the 27th and 28th of December, at the rate of 13 miles an hour. As might be expected, its diameter was not so great as usual, being felt at Fayal, Terceira, and Flores, on the 27th, and not until the 28th at St. Michael's. Its half diameter is, therefore, the distance from its centre, on the 27th, to Terceira, or 260 miles.

The fourteenth gale, although felt at Flores and Fayal, blew with the greatest violence in its passage over St. Michael's, where it caused the wreck of two ships. In the harbour of Terceira, which has the same exposure as St. Michael's, the ships lying at anchor were not disturbed. There are no means of ascertaining the diameter of this gale; but, judging of its progressive velocity, it must have been less than usual.

The fifteenth gale was felt at Flores and Fayal, on the morning of the 3rd, but not at Terceira. Its half diameter could not, therefore, have exceeded 280 miles, its progressive velocity being more than 9 miles an hour: it passed to the north of the islands.

The sixteenth gale was of moderate force, and does not tend to develope any general results. It cannot be traced beyond the third day, when it had only proceeded 300 miles. Its half diameter was probably not less than 440 miles.

The seventeenth gale, which was felt severely at Flores, on the 6th, had on that day reached Terceira, but it was blowing strong at Fayal. This gives an indication of its diameter, the radius of which must at this time have been 320 miles. On the 7th, it suffered a diversion to the eastward, and lost force in its onward progress. On the 8th, it appears to have met another interruption from the eastward, and its progress on that day was very considerably lessened. It appears to have been overcome by this interruption on the 9th, and deflected to the westward, when the small progress that it made attests the conflict between the gale and the interrupting cause. On the 10th it overcame this diversion, and proceeded in its original direction to the eastward. The disturbance was not productive of such squally, frequent, and sudden changes of wind in its neighbourhood, as would have been the case, if the disturbing cause had been a gale coming in an opposite direction. This gale ceased to be felt at Flores on the 10th, making its half diameter about 230 miles, in the latter part of its course.

The eighteenth was a deflected gale, losing progress as usual during its diversion. On the morning of the 21st, it had disappeared from Flores, and its half diameter may therefore be taken at 270 miles. The recovery of its primary direction, on the 21st, restored its progressive velocity, which it is probable was further increased on the 22nd, when it ceased to be felt at Terceira, and its half diameter had diminished to 250 miles.

The nineteenth gale, in the regularity of its progress, is a confirmation of the effect of deflection on the courses of storms. It passed across the centre of the Azores, at a regular rate of 8 or 9 miles per hour, disappearing from Flores during the 9th of September, when its centre was about 300 miles distant.

The twentieth was deflected on the morning of the 19th of September, and took a new course to the south with diminished velocity. On the 21st, it recovered its first direction, but does not appear to have regained its original velocity. This gale was but little felt at Fayal on the 18th, and disappeared there during the day. Its half diameter was therefore about 350 miles.

Having thus given the particulars of the twenty gales, of which the courses have been accurately observed, during the years 1840 and 1841, there appear to be some general conclusions which may be deduced from them. The first circumstance developed by the enquiry is the general direction of storms passing across the Azores. This is invariably from

N. W. to S. E.,—a conclusion with which the second, seventh, fifteenth, sixteenth, and seventeenth gales of the accompanying table would undoubtedly be found to agree, if their investigation could be carried further.

The coincidence of this course with the Great Atlantic Current, which is a continuation of the Gulf Stream, which may every day be traced to the neighbourhood of the Azores, and which the sudden rise of water in those islands (where, having been hastened by a gale, it is suddenly checked in any locality by the operation of the wind, accompanied by a diminution of atmospheric pressure,) proves to be sensibly carried beyond them, goes very far to identify the Azorean storms with the tropical gales and hurricanes, traced in the able work of Col. Reid, from the South American coast, along the course of the Gulf Stream to Cape Hatteras, in North America. There is a further resemblance in their diameters. In the chart, which Col. Reid has composed, of the great hurricane of October the 10th, 1780, the diameter given to it, in the latitude of the Azores, is about 550 miles. Of the Azorean gales under consideration, four were about this diameter; eleven of about or under 650, and five under 900.

With respect to navigators, for whose benefit these enquiries are chiefly intended, the use which may be made of this knowledge of the courses taken by storms across the Azores, is in the direction of vessels which may be reached by them. It seems probable, that if a ship were caught by a violent gale in the current of the Gulf Stream, near the Azores, her best course would be to steer, so far as the veering of the wind would allow, due north or south;—that if she steered to the eastward, she would accompany the gale, and be overtaken by the greater violence of its centre; and that by steering to the west, she would sooner meet the centre, or run into a new gale.

Whatever may be the cause of the occasional deflection of the Azorean storms, whether it arises from collision with another storm, or from atmospheric gravitation, (the radiation of heat from the islands being at all times very great,) the uniform effect appears to be a diminution of their progressive velocity, and frequently an increase of their rotary force.

But as far as these effects can be foreseen, from a knowledge of the deflection, (presuming it always to be accompanied by a slower progression,) it is worthy of observation, that the deflection never appears to take a turn to the northward, but always to the south. If this be true, the safest course for a ship in these gales is to the north, unless there are very cogent reasons for a departure from this presumed rule.

I cannot close this report without regretting that there are no means, in the upper islands of the Azores, of combining the observations upon which it is founded with barometrical notices.

There are many barometers in St. Michael's, but not one in either of the other islands. The facts of this nature, developed by one barometer, are not of much importance; but by comparing the result of these observations, made at the same hour in the different islands, during the passage of a gale, it is likely that valuable conclusions might be elicited from them. There is, indeed, no country so well adapted for the collection of information, for the developement of the laws of storms, and meteorological changes. The islands, nine in number, are so scattered over a considerable region of the Atlantic, and separated by such distances as to receive, at the same hour, different atmospheric phenomena. Were it the wish of government to obtain meteorological information from this part of the Atlantic, a moderate remuneration would secure regularity in the registers of the Vice-Consuls,—salaried or unsalaried; and they might, at no great expense, be furnished with wind-dials, barometers, sympiesometers, and hygrometers, (the latter of which would be useful in determining the origin of a gale,*) for the purpose of rendering their observations complete

THE MADEIRAS.

PORTO SANTO. Ships from Europe, bound to Madeira, are recommended to make the island of Porto Santo, which lies 40 miles N. E. It is very remarkable, and may easily be discriminated from Madeira, by its appearing as three large high hummocks, which are discerned in fine weather as far distant as 20 leagues. It has on the S. W. side a roadstead, equal in many respects to Funchal, where there is a neat little town that produces refreshments, and plenty of water. With the exception of a few pines and palms, Porto Santo is destitute of wood. There is not even brushwood. For fuel, therefore, the inhabitants depend on Madeira. The island is occasionally used as a place of exile from the same place. Large boats trade between Porto Santo and Madeira. Between the two isles the prevailing wind is generally from the N. E.

To the northward of Porto Santo, about 9 miles, there is a ledge of rocks on a bank extending east and west, terminating in a reef; these are called the Falcon Rocks; they are steep-to, and the shoalest part (on which are 4½ fathoms) lies with the N. E. point of Porto Santo, bearing S. S. E.; the Ilheo da Fonte, or northernmost rock, S. by W.; and the west point of the island, S. S. W. Some rocky ground, of 40 fathoms, lies about 3 miles to the E. S. E. of Ilheo de Serra, the south-eastern islet of Porto Santo.

The DESERTAS, which derive their appellation from being uninhabited, are three long rocky islands, lying in a north and south (N. N. W. and S. S. E.) direction. When they bear W. by N. they appear separate, Bujio, or the southernmost of which, is the smallest. The northernmost islet looks like a low wall at a distance; near it is a high rock called the Pyramid, which has frequently been mistaken for a ship under sail. There is a free passage between the two large Desertas, which, however, ought not to be attempted, except in cases of emergency or dire necessity. But between Madeira and these islands there is a fine open channel, 8 miles in breadth, having no danger but what is seen, and a strong current setting through to the S. W. It is always advisable for vessels coming from the eastward, with the wind N. E., to frequent this channel; particularly as N. E. winds often produce eddies from the mountains, sufficiently strong to prevent ships approaching from the eastward, and, indeed, to blow them off altogether. Steer, therefore, as near mid-channel as possible, without too soon borrowing on the Madeira shore, where you are liable to be annoyed by the calms and eddies off Brazen Head.

MADEIRA. This island is one mass of basalt, rising with a rather steep ascent from the south, and from the north towards the interior, where the highest part of the mass runs from south of east to the north of west, between Cape de S. Lourenco, on the east, to Cape de Pargo, on the west. This, the most elevated portion of the rock, rises to 4000 and 5000 feet; the Pico Ruivo, the highest summit, attains 5993 feet above the sea-level.

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* In the Azores, a southerly wind creates great humidity in the atmosphere,—a northerly wind removes it. Under the former influence, there is frequently two per cent. of water in the air,—under the latter, less than one. At Flores, such an instrument would give the most valuable results, in showing whether the gale passing had come from the south, where the heated air takes up moisture, or from the north, where a different condition repels it.

Both declivities of the mountain-mass are furrowed by deep and generally narrow valleys and depressions, traversed by streams of clear water. These valleys contain the gardens and vineyards. The vineyards are formed on the declivities of the rocks, to the height of 2300 feet above the sea. The rocks in most places come down to the very shore of the sea, and enter it with so rapid a descent, that soundings are to be only found close to the shores, and even there on a rocky and unequal ground, and at a depth of 35 to 50 fathoms.

The climate of Madeira is very mild. The mean temperature of the year does not exceed 68°. In the months of December and January, the thermometer rarely sinks below 60°, the mean temperature of that season being 63°. The mean temperature of the hottest months (August and September) is between 73° and 74°; but when the eastern and south-eastern winds bring to the island the hot air from the African desert, the thermometer sometimes rises as high as 85°, and even 90°. Rain is not confined to a certain season of the year, but occurs at all seasons. Madeira sometimes suffers from hurricanes. The climate is considered very healthy, and many persons in England, who are suffering from, or in danger of consumption, withdraw to it, for the purpose of diminishing their sufferings and prolonging their life.

The capital of the island is FUNCHAL, on the S. E. coast. It consists of a pretty wide street along the sea-shore, where there are several good buildings, and numerous small lanes, which extend to a considerable distance up the slope of the hill. The number of houses amounts to about 2000, and that of the inhabitants to 20,000. The town is defended by four forts, and has eight churches and several convents. In the midst of the town is an open square, planted with exotic trees, as dracœna draco, jasminum azoricum, and datura arbosea. The population of the island is estimated at 80,000, and are a very industrious and enterprising people.

THE BAY OF FUNCHAL is formed on the west by the Pico and Point de Cruz, and on the east by Cape Gerajao, or the Brazen Head : the last, although not the loftiest of the mountains, yet, by its projection, it forms the eastern horn of the bay, and becomes an object of attraction to vessels having to round its point. Having left the Desertas, and steering for the Road of Funchal, it will soon be perceived, Loo Rock and castle appearing to the westward of the town : this brought in a line with the citadel, or Peak castle, bearing about N. N. E. ¼ E., and Funchal steeple N. E. ¼ N., affords good anchorage in 35 fathoms; or you may anchor in 20 to 30 fathoms, distant half a mile from the Loo Rock, with the citadel a little open to the eastward. When blowing fresh from the S. W., the citadel, or Peak castle, well open to the westward, is considered a good berth. The ROAD OF FUNCHAL is quite exposed from the West to S. E., consequently from these points the winds are strongest, and ships, on the appearance of a menacing atmosphere to the southward or the S. W., ought to take every precaution, and be in readiness to go out of the roads at a moment's warning.

In summer, there are regular land and sea breezes ; the latter setting in from the S. W. in the forenoon, and off shore towards 9 or 10 o'clock in the evening, sometimes as late as midnight. The land breezes do not extend more than 2 or 3 miles from the shore; but when it blows fresh in the offing, the true wind prevails in the road. The rainy season is in January, February, and March, when it blows sometimes excessively hard, at which season it is frequently dangerous to remain at the anchorage ; and during this period of the year, the surfs on the beach are so incredibly violent, as to prevent a possibility of landing anywhere but behind the Loo Rock.

Sailing out of Funchal, you should particularly observe to make sail with the land wind, standing directly out to the offing, on account of calms which prevail under the West and S. W. parts of the island, which have been known to detain vessels for some days.

Although MADEIRA is an elevated island, with the exception of the eastern end, which is a low rugged point, yet it is often so obscured by clouds as not to be discerned at a distance of 5 leagues; but when abreast of Porto Santo, it commonly appears like a vast mountain, with its summit covered over. The Desertas are shortly afterwards seen, and when you pass those islands, the ships in the road of Funchal will soon be perceived. From their riding, it will be seen how the wind is in the road, as it is common to have a strong breeze from N. E. or East, in passing the Desertas, when at the same time, the wind in the road is from the S. W. or W. S. W.

PORT REGULATIONS. On anchoring at *Funchal Roads*, no vessel can have communication with the shore, or the shipping in port, until visited by a flag-boat from the government, or from the health office. But in case of distress, when a vessel does not intend to anchor, and wants to have communication with the shore, her boat, by proceeding to the Loo castle, will avoid being fired at; and after examination, leave is generally given for the officer in her to go into town, and return to the ship without any embarrassment.

The master, purser, or other persons coming in the first boat from any vessel regularly visited, must land at the health office, there to undergo the customary examination; and the captain or purser should proceed immediately to the consul's office, to report the ship: passengers are free from restraint after passing the health office.

Captains or pursers, so landing, must bring with them the vessel's register and Mediterranean pass, and also the manifest of her cargo, as without these documents business cannot be transacted at the Consular and other offices.

No vessel lying in port can have any communication with one that is coming in, or that has already anchored, until such new comer shall have been regularly visited.

No vessel at anchor can change her berth without license from the government.

All boats that pass between the shipping and the shore, after sunset, are subject to pay a pistareen and a half, for a government license.

No seaman or soldier to leave their ships, without permission in writing from the captain or commanding officer.

Any seaman or soldier found on shore after sunset, without written leave of absence, is liable to be taken up by the government, and kept in custody until claimed and sent on board ship; which will, exclusive of his maintenance, occasion an expense of 2 dollars for each individual, to be deducted out of his wages: and even with leave, as above, any disorderly conduct is immediately taken notice of by the government, and punished accordingly.

All captains or commanding officers are requested to read the above two articles to the sailors and soldiers on board their ships, as particularly relating to them.

Captains or pursers must give notice at the consul's office, 24 hours, at least, before the time of their intended departure.

No vessel is to carry from Madeira any person or persons, excepting those that came in her, *without a regular passport;* as, in case of detection in attempting to do so, the master is liable to a fine of 100 dollars, and to 3 months' imprisonment.

In cases where the captain of a vessel shall be judicially notified not to carry away any particular person from the island, and he does receive him on board, notwisthstanding such judicial warnings, he becomes liable for all the debts which such person owes.

When vessels are ready to depart, the captains must, through the consul, or their consignees, apply to the government to have its visit sent on board at the hour when they will be ready to proceed to sea.

After a vessel has been visited for the purpose of proceeding on her voyage, and circumstances require her to have communication with the shore, or the shipping in port, she cannot sail until visited a second time.

No vessel can sail after sunset, without special license; and in case a ship is visited for departure, and finds she is obliged to remain a night after, she must not attempt to sail till visited a second time.

As vessels are frequently fired at from Loo castle, for attempting to anchor at night, it is recommended to those who make the port too late in the evening, to have their colours seen, to stand off and on till daylight, when the restriction ceases; indeed, at all times it is as well to hoist the colours and merchant's signal as early as possible, for the information of the consignees on shore.

Any vessel attempting to get under way before she is visited, will be fired at from the forts, and will be obliged to pay very dearly for the powder and shot. This must also be understood in not observing any of the foregoing rules.

No commander of a vessel can leave any of his crew behind him, excepting in the hospital, without first giving security in the consul's office for their subsistence.

As the greatest attention is necessary on the part of the masters of vessels, for the benefit of the concerned, it will be found much to the interest of all parties, that they by no means sleep on shore,—a caution of this kind is doubly necessary in the winter.

It is necessary that captains and supercargoes should be acquainted, that in case of breakage in the measurement of corn, after allowing 2½ per cent., the vessel must make up the deficiency at the market price in Madeira, according to the long-established regulation of the British factory.

The Loo castle usually fires two guns without shot, on any vessels breaking the rules of the port: if those are attended to, in general they take no more notice; if not, not only the Loo, but the other forts, fire with ball, till their object is obtained.

As many inconveniencies arise from not observing the foregoing regulations, every commander of a vessel will find it to his interest to attend to them, as otherwise he will forfeit the protection of his consul, and find the consequences in the highest degree disagreeable.

To avoid considerable delay and expense, it is absolutely necessary to have a bill of health, endorsed by the Portuguese consul, or his vice-consul, of the last port of clearance.

THE SALVAGES. Between Madeira and the Canaries, there are a cluster of rocks and islands called the Salvages, bearing due North, about 27 leagues from Point Naga, in Teneriffe: they are rather dangerous to pass in the night, but a south course will give them a good berth to the eastward. They consist of the Great Salvage, the Great Piton, and the Little Piton, and may be seen 7 leagues off in clear weather. They lie in a

N. N. E. and S. S. W. direction, connected with each other by a ledge of rocks. There is an anchorage on the S. E. side of the Great Salvage.

TIDES. It is high water on the full and change of the moon, at Funchal, at 12 h. 15 m.; the mean vertical rise of the tide is between 8 to 9 feet. Variation, 21° W.

THE CANARIES.

The CANARIES consist of the following large islands:—Palma, Ferro, Gomera, Teneriffe, Canary, Fuertaventura, and Lanzarote. There are also some smaller islands, as Graciosa, Alegranza, and Santa Clara. The coasts of the islands are high and precipitous, but here and there broken by deep clefts. The mountains generally rise towards the centre of the islands, bleak and bare, and are full of pointed rocks. During the winter there is snow on several of the highest summits. The Peak of Teneriffe, a half extinct volcano, rises to the height of about 11,400 feet, and as it is viewed from the sea at a distance, seems to spring out of the water like a sugar-loaf. They are all of volcanic formation, and in parts exceedingly fertile; they produce grain and fruits, both tropical and European, in abundance. An active trade is kept up among the islands, and they have large fisheries on the African coast. There are no close harbours, the anchorage being generally open roadsteads, few of which can be considered safe, except during the fine season. The depth of water between the islands is very great, and the passages are good. Supplies of provisions, &c., may be obtained from any of them, though some of the islands are without water, and depend on rain, which they keep in tanks. Each island has its governor; but the whole group is under a governor-general, who commonly resides at Teneriffe, though all the law courts are held at Canary. Being situated within the general limits of the trade-wind, these islands enjoy a a fine climate, and are very healthy; in summer, there is a land breeze off them at night. The S. W. winds, though rare, blow strong and bring rain, while the S. E. wind is dry and hot, like the sirocco of the Mediterranean.

Palma. This island is remarkably high, and may be descried at a very considerable distance, consequently, run for with the greatest confidence in the night. The channel between it and Teneriffe is 40 miles in breadth, and perfectly free from danger, having on both sides excessive high land, with a bold shore. Vessels from the northward, bound to the coast of Africa, are advised to use this passage, as the breeze is usually found fresher and more continued than in any other, and the calms are of less duration. It is, however, necessary to keep in mid-channel, borrowing rather towards the Palma shore, in order to avoid getting too soon under the lee of Teneriffe.

The chief port of Palma is that of **Santa Cruz**, on the east side of the island, but, as the land behind the town is high and steep, the shipping can only be discerned at a short distance. In order, therefore, to avoid getting to the southward of the road, a stranger is recommended to edge in to the northward, and run down along shore, until the town and shipping come in view. Vessels here ride in 12 to 20 fathoms, during all winds; for although it is exposed to the eastward, yet, if you are provided with good anchors and cables, you need be under no apprehension, for the ground is clean and good, and the great height of the land, facing the road, repels any wind, though ever so strong. There is a port on the S. W. side of

Palma, named Tessacorta, but it is exposed to westerly winds, and chiefly frequented by fishing boats.

FERRO. This island is the westernmost of the Canary islands; it has a small town, with a church, but there is neither road nor harbour to claim description. Its productions are inconsiderable, and there are only three fountains or springs on the island, from which fresh water can be obtained.

GOMERA is somewhat larger than Ferro, and lies about 14 miles W. S. W. from Teneriffe. Its principal town is St. Sebastian, being situated at the bottom of a commodious bay, on the east side: here vessels may ride in from 15 to 7 fathoms, entirely land-locked from all but S. E. winds. It is essential to be securely moored here, on account of the strong eddies, particularly off the land, which frequently come in severe gales. The best situation for a vessel to lie in, is about a cable's length from the beach, having a full view along the main street of St. Sebastian.

TENERIFFE. Point Naga, the N. E. extremity of Teneriffe, bears N. W. ¾ N., (N. W. by W.,) 15½ leagues from the Isleta, or N. E. Point of Canaria, or Canary; the distance between the nearest parts of the islands is not, however, more than 10 leagues. About the centre, or rather towards the western side, is the celebrated Peak, better known to the inhabitants by the appellation of the Peak of Teyde; it is, generally speaking, overcapped with clouds, and is distinctly seen upwards of 100 miles. The islanders say it is visible 160 miles, but this appears doubtful, and almost impossible; for although its height might extend beyond the sensible horizon, the atmospheric medium of the intervening distance, would totally envelope it, and preclude the possibility of its being seen.

Santa Cruz is the principal port of Teneriffe. It is situated on the east side, about 15 miles from Point Naga. The best road for shipping here, is between the middle of the town and a fort or castle, about a mile to the northward of it: in that space, ships anchor either in 6 or 8 fathoms, at a cable's length from the shore; or in 25 or 30 fathoms, half a mile distant. Care must be observed, in going in, not to bring any part of the town to the northward of west, lest calms should be caused by the land under the peak; and should you be driven ashore, anchors and cables are of no use, as you will have no ground on the opposite side of the ship, with 200 fathoms. When a ship lies any time in the road, it is necessary to buoy her cables, otherwise the ground, being in some places foul, may chafe and spoil them. Here vessels, if moored with good cables and anchors, may lie securely in all winds, although the bay is exposed and open to those which blow from the N. E., East, and S. E.; however, it is not above once in the space of 4 or 5 years that they blow so hard as to cause any considerable damage.

Quarantine Regulations. 20th November, 1832. On the appearance of a British ship, a boat with a pilot, and carrying the Royal Spanish flag, will leave the mole, and point out the quarantine anchorage. If, from circumstances, it should be necessary to anchor, before communication can be had with the boat, the line of quarantine anchorage is S. E. and N. W., by compass, with the mole-head, (nothing to the north of it); distance from 2 to 6 cables' lengths from the land; the depth of water, 10 to 20 fathoms, rocky. Anchorage to the north of the line stated, is for vessels admitted to free pratique. No ship is to lower boats, or communicate in any manner whatever, until visited by the health-boat, and permission obtained. Ships bound to any port in any of the Canary islands, from infected countries, must come to this bay, which is exclusively appointed for the observance of quarantine.

The Port of Orotava is on the west side of the island, about 26 miles

S. W. of Point Naga: it is exposed to N. W. winds, which cause a heavy swell, but these, luckily, seldom occur, and in general give sufficient warning to afford time for a vessel to get away. The anchorage is in 40 and 50 fathoms, about a mile and a half from shore, with the peak bearing S. W. Considerable damage was done to Orotava and its vicinity, by a dreadful hurricane which occurred there, in November, 1826.

Directions to be observed by British Vessels frequenting the Island of Teneriffe. "A bill of health is an indispensible document for a vessel's admission here, from whatever port she may arrive. The quarantine-laws are very rigorously enforced, and the want of a bill of health subjects vessels, even from England direct, to a quarantine, that is never removed without the ceremony of repeated health-visits, and payment of heavy fees. Great care must be taken not to get to leeward of the island, as it is a tedious and difficult matter to get up again, the usual and prevalent winds being between N. N. E. and E. N. E. Point Naga should be made, which is the N. E. point of the island; it is very high, and is easily to be known by two large high rocks lying close to it, which appear like ships, and may be seen 7 or 8 leagues off. You must then run down till you come within 2 or 3 leagues; and if bound to Port Orotava, you must steer down along the north shore, (which is very bold, and quite free from danger,) keeping 2 or 3 leagues distant; and, after running down 8 or 9 leagues, if you should not see the peak, which is often clouded, you will see a large white town (Orotava) on the side of the high land, about a league inland, with two small regular-shaped green hills under it, between which you must steer directly in, and, by so doing, will raise, as it were, another town out to sea: this is Port Orotava, for which you must steer directly in, until you meet the pratique-boat, which will be about 2 or 3 miles off; it is a low boat, and comes with the Spanish colours set upon a staff;—at any rate, you must not be afraid of running in for the land, as it is very deceiving, and you will be 4 or 5 leagues off, when you do not think yourself so many miles; in that case you will not soon get a boat, for they do not come off until you approach very near. The boat, when she comes, brings a pilot, and leaves him on board. You must also bring with you your register, pass, clearances, &c.; and you must take care not to deliver either letters or other papers (except your bill of health) to any person who may ask for them, without some document either from your consignee or the consul.

"In running down, you must prepare your anchors and cables; and it is customary to bend your small bower cable, with which you will bring up, with only one turn round the windlass, in order that it may run out quick, as the spot where you ride (about half a league off, and to the westward of the town) is very small; and if there be many vessels there, it is necessary that your anchor go very quick, as you bring up in from 30 to 40 fathoms of water; but there is little or no tide, and she will bring up easily. You must give her the whole cable round the windlass; your buoy-ropes should, therefore, be 45 fathoms long. During the summer months, from April to October, all vessels are moored in an inner harbour, or creek, with iron chains, kept by merchants for that purpose. Vessels that fall to leeward very often lose much time by mistaking Garachico for Port Orotava, from whence it is distant 4½ leagues West. There is some similarity in the appearance of these places, Garachico having also above it a white town, inland, called Icod; but besides, by their situation, Garachico being much nearer Point Teno, the west point of the island, these places are very easily distinguished by the above-mentioned two equally-formed round green hills. Point Naga lies in latitude 28° 36′ N., and the Salvages lie true North from the point, distant 28 leagues.

"The Grand Salvage is very high, and may be seen 10 or 12 leagues off. Your direct course from the Grand Salvage to Port Orotava is S. W., (by compass,) and distance 38 leagues; but particular care must be taken not to fall to leeward. The Peak of Teneriffe may sometimes be seen 40 leagues off, but it is very often hidden by clouds. Should it happen in the winter that you arrive off Port Orotava, during a N. W. or N. N. W. gale, which rarely occurs, but throws in a very heavy sea upon the coast, and would prevent a boat going off to you, it is best to bear away for Santa Cruz, on the S. E. side of the island, after doubling Point Naga.

"Santa Cruz is the preferable place to touch at, for vessels in want of water and refreshments. All vessels, on approaching these ports, ought to hoist their colours, and show their consignee's signal; or, when unconsigned, and only visiting the island, a union jack at the fore, and a white flag with a pendant over it at the main, in order that boats may be early sent off to them by their consignees, or by the consul."—*Advices from Teneriffe, dated the* 11*th November*, 1816.

CANARIA, OR GRAND CANARY. This is a very high and mountainous island towards the centre, terminating on the N. E. by the Isleta, a peninsula which lies about 15½ leagues, N. W. by W. ¼ W. (W. by N.) from Point Handia, the S. W. end of Fuertaventura. The peninsula is about 8 miles in circumference, connected to the island by a narrow isthmus about 2½ miles in length, each side of which forms an extensive bay. That on the east side is called Puerto de Luz, and is a spacious sandy bay, with good anchorage, for vessels of all burthens, within half a mile to 1½ mile N. E. from the town, but the latter distance is to be preferred, as the ground is better. There are several steep rocks at the entrance, on the N. E., which protect the shipping, and you may lie secure from all winds, with the exception of that from the S. E. to which the bay is quite exposed; however, it but seldom happens to have it blow sufficiently fresh from that quarter to endanger the shipping. PALMAS, the capital of the island, is a large town situated at the bottom of the bay, to the N. W. of which there is a fine smooth landing-place: here a plentiful supply of water and refreshments may be procured. Vessels with cargoes for Palmas often anchor, in fine weather, within half a mile of the town, but it cannot be considered a good roadstead. The bay, on the west side of the peninsula, is exposed to heavy swells and N. W. winds, and is consequently only frequented by small craft, sheltered between a ledge of rocks and the shore, very securely.

Between 3 or 4 leagues to the S. E. of Port Luz, situated about the middle of the east side of the island, is the town and port of Gando, where there is good anchorage, well sheltered from all winds, except from the southward. Water and other refreshments may here be obtained.*

FUERTAVENTURA is a long narrow island, lying to the eastward of Canary; its length is about 20 leagues, and its breadth from 2 to 5 leagues. Point Handia, its south-western extremity, lies in latitude 28° 4′ N., and longitude 14° 31′ 30″ W.; a rock lies at half a mile from it to the S. W. Off the northern point of Fuertaventura, is Lobos, or Seal island, which is about 1½ league in circumference, uninhabited, and destitute of water. Near this island is a good road for shipping; the mark for which is, to bring the east point of Lobos to bear nearly N. E. by N., and anchor halfway between it and Fuertaventura, or rather nearer to the latter. Although this road seems to be open and exposed, yet it is very safe with the tradewind, for the water is smooth, and the ground everywhere clean, being a fine sandy bottom. Directly ashore from the road, on the shore of Fuertaventura, is a well of good water, of easy access.

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* It is asserted by the pilots of Teneriffe, that a rock, with only 12 feet of water over it, lies W. N. W. 2½ leagues from Point Aldea, the western point of the Grand Canary, and that the sea breaks on it, in rough weather.

The channel between this island and Lanzarote, is named La Bocayna, and vessels sailing through here, from the eastward, with the trade wind, will lose the breeze when under the lee of Lanzarote, and find baffling winds at S. W. You must therefore fly to the Lobos side, where you will soon get a steady northerly wind to carry you through. Do not approach too near on Lobos, as the ground there is foul and rocky, which causes a heavy swell, with breakers of incredible height; the noise they make is sometimes heard 5 or 6 leagues off.

LANZAROTE. This is a dark, rocky looking island, and may be descried at a great distance; it lies in a N. E. and S. W. direction, 10 leagues, and is about 3½ leagues wide. The principal harbour is that called Puerto de Naos, on the S. E. side. Vessels drawing under 18 feet, may enter it at high water, spring tides, and lie securely in all winds; although in sailing along the coast, the shipping appear to be at anchor in an open road, the harbour being formed of a ridge of rocks, seen at only a short distance, as they are mostly under water; these break off the swell of the sea, so that the inside is as smooth as a mill pond. Puerto de Cavallos, or El Recipe, is separated from the former by a square stone castle, standing at the west side of the harbour; it is sheltered like the other, by a ridge of rocks, but it has only 12 feet water at high spring tides.

Between Lanzarote and the island of Graciosa, off its north point, is the spacious harbour of El Rio, which is the channel between them: here vessels of any size may pass in midway in 7 or 8 fathoms. If a smooth place to lie in, while the trade-wind blows, be required, a ship coming into this harbour, from the eastward, must run a good way in, and double a shallow point which lies on the starboard hand; this must not be approached in less than four fathoms, and when beyond it, you may anchor in any depth you please. The water, however, here, is not so smooth as at Puerto de Naos, especially if the trade-wind happens to blow hard from the East, but it does not often come from that quarter, as those which are most prevalent blow from North and N. N. E. To moor here, care must be taken to have a good anchor, and a long scope towards Lanzarote, for, in East and S. E. winds, heavy squalls come from the high land of that island. In winter, the wind sometimes shifts to the S. W.; in that case, it is necessary to weigh and run to the eastward, round the shallow point before noticed, until you find shelter.

GRACIOSA, ALLEGRANZA, &c. The former of these islands, as it has already been mentioned, is divided from Lanzarote by the strait of El Rio: the island is about 3 miles long, and 2 miles in breadth. To the westward of Graciosa is the rocky, uninhabited island of Clara, near to which is a large high rock, called the West Rock. Six or seven miles to the northward is the island of Allegranza; to the S. E. is a high rocky islet, named the East Rock. Allegranza, Graciosa, and Clara, are only visited for the orchilla, which is here abundant, and Canary birds, of a beautiful plumage, are numerous.

Directions. If a ship, lying at Palma, is desirous of going to Lanzarote, and will not wait for a fair wind, (which indeed seldom blows there, especially in the summer season,) let her stand over to the N. W. side of Teneriffe, and beat up along shore, until she weathers Point Naga; thence, with the wind that generally prevails in these parts, she will be able to weather Canaria, and fetch the point of Handia, or Fuertaventura, or perhaps Morro Gable, (the southern point,) whence it is easy to beat up to Pozzonegro, along the east side of the island, because the sea there is always smooth. It is not quite so easy to beat up from Pozzonegro to the Isle of Lobos, yet it may be done, without much difficulty, when the weather is moderate ; if the wind should happen to blow hard, she may stop in the bay of Las Playas, until it proves more favourable.

From the Isle of Lobos, she will find no difficulty in beating up to Porto de Naos, in Lanzarote. It is not advisable for those who are not perfectly well acquainted with that harbour to attempt to conduct a ship in, because the entrances are very narrow.

It is common for ships, which come loaded from Europe to Santa Cruz, Teneriffe, &c., to have part of their cargoes to unload at Port Orotava. These ships, when the trade-wind blows hard, will sometimes find it impracticable to weather Point Naga: when this is the case, they should bear away to the leeward point of the island, and keep near the shore, where, if they do not meet with a southerly wind, they will be carried by the current, in the space of 24 hours, from the S. W. point of the island to point Teno, whence they may easily beat up to Port Orotava ; for, when the wind blows strong at Point Naga, it will be moderate weather all the way, until within 2 or 3 leagues of Point Naga. But a ship should not bear away, as above directed, unless when the trade-wind blows so fresh that she cannot weather Point Naga ; because, in moderate weather, there is little or no wind stirring on the coast between Teno and Port Orotava.

The coast of Africa, east of the Canaries, is level, and rendered dangerous, and almost inaccessible, by a heavy surf which breaks on it continually. The Canarians, in the sea between this coast and the islands, employ a number of barks in fishing for bream and cod. The passage is about 20 leagues wide, and clear from any known danger.

WINDS AND CALMS PECULIAR TO THE CANARIES. In the vicinity of the islands, brisk trades are, generally speaking, most prevalent from N. E. to North, throughout the year. They sometimes give place to N. W. and S. W. breezes, the latter of which not unfrequently blow for a continuance of ten days. And on account of the enormous height of the mountains, when near the land, you are subject to strong gusts and eddy winds blowing in an opposite direction to that outside, which the navigator ought to avail himself of, when beating to windward. Vessels sailing through, most commonly carry the breeze a few leagues to the southward of the islands, more or less, according to the strength and direction of the wind, which, if far north, will take you more to the southward, and the contrary, if to the eastward.

On approaching the calms, you will find a heavy, disagreeable, bubbling swell; the sea breaks, and is very irregular, consequently producing a distressing motion to the ship, which renders it necessary to take advantage of every breath of wind to get to the southward. These calms are occasioned by the intervening high land of the Canaries obstructing the regular course of the trades, and extend from 10 to 30 leagues to leeward, in proportion to the power of the breeze outside. And it may farther be observed, when the trades are light, the calms are more extensive; at which time, however, light S. W. breezes prevail; and, on the contrary, when they are strong, the calms are very circumscribed, but not the slightest air within for some days.

Between the Canaries and the Cape Verds, a current runs to the S. W.

at the rate of half a knot, increasing as you approach the islands. In about the parallel of 14° and 16° N., the trades begin to lose their strength, veering round from the northward to the N. W., and from thence to the westward, and S. W., as you draw in with the coast of Africa, in the latitude of 7° and 10° N.

TIDES. It is high water generally among the Canaries, on the full and change of the moon, at 3 o'clock. Springs rise from 8 to 10 feet. The variation is about 20° W.

THE CAPE VERD ISLANDS.

These islands are ten in number, and lie about 100 leagues on a parallel to the westward of Cape Verd, the nearest point of Africa, from whence they derive their name. They were first discovered by the Portuguese, who named them as follows:—Ilha de Sal or Salt Island, Bonavista, Mayo, St. Jago, Fogo, Bravo, St. Nicholas, St. Lucia, St. Vincent, and St. Antonio; besides several small islets. They are of submarine volcanic formation, and boast a climate and vegetation approaching nearer that of the temperate regions. The most considerable is that of St. Jago, the chief town of which is the seat of government.

The best course for vessels bound to St. Jago, from the Canaries, is to stand on to the southward, to about 25 to 30 leagues to the eastward of Bonavista, and from the latitude of 16°, which is that of the middle of the island: they should sail westward to get sight of it. It has also been observed, "Though it may seem natural enough not to suspect any errors of consequence in your reckoning, in so short a passage, as from the Canaries to the isles of Cape Verd, yet there are instances of such, as well to easting as to westing. It is with respect to errors in our westings, that I advise all vessels to keep 30 leagues to the windward of Bonavista, before they stand in to make the land; lest, in keeping a direct course for that island, they should pass between the Isle of Nicholas and the Isle of Sal; and, finding themselves to the westward of Bonavista, when they reckon themselves to the eastward of it, they should miss of their refreshments at the Isle of St. Jago,—an accident which has happened to several vessels."

"The making of these islands is often difficult, occasioned by the fogs, which hang frequently around them. For this reason, those who come from the northward, ought to steer their vessels in this tract with all possible precaution."

"The most convenient course for vessels which continue their voyage from the Canaries, without touching at the islands of Cape Verd or Goeree, is to steer, after they lose sight of the Canaries, so as to pass about 45 leagues west of Cape Blanco, (or near the meridian of 26°;) from this position they will make good their course due south, as far as 12° N., and afterwards S. E. by S., till they meet with those variable winds which succeed to the trade-winds. By this they will keep the mid-channel between the islands and Cape Verd, and coast along the bank below that cape a sufficient distance, even though they should make an error in their reckoning of 15 to 20 leagues eastward."

THE SARGASSO SEA. A vast portion of the sea, to the N. N. W. and N. W. of the Cape Verd islands, between the parallel of 12 and 35 degrees of latitude, is commonly studded over, like an inundated meadow, with bushes of a marine plant, called the *fucus natans*, in some places very abundant, and in others more dispersed. Hence has this part of the ocean been denominated the Mar de Sargasso, or Grassy Sea. If we could imagine the surface of a wide extended moor covered with water, the furze and heath bushes would appear something like the clusters of fucus scattered over the thickest part of this sea. It has thus been described by a modern writer:—"The sea, within the vicinity of these islands, is particularly remarkable for the immense floating beds of wrack, or sea weeds, dispersed over its surface, and has given rise to various opinions as to its place of growth, and whence it is ultimately deposited. It, however, proves decidedly to be an American plant, a species of the *algæ*, called the *fucus natans*, produced from the rocks and shores contiguous to the Florida Gulf, from whence it becomes detached on arriving at a state of maturity, and carried off by that well known stream to the African coast, returning from thence again to the westward, in the course of the trades."

"It has been a subject of surprise to many naturalists, that this plant should never be found in its withering state; but like every other species of the vegetable world, it proceeds with equal regularity through the process—growth, maturity, and decay. It certainly continues vegetating for a considerable period in its detached state, and is supported by the air globules which cause its buoyancy; but immediately the symptoms of decay manifest themselves, the buoyant principle is lost by the sudden discharge of the globules, and the plant sinks, which accounts for its not been frequently seen in its last stage." Notwithstanding this opinion, many others affirm that the weed grows on the rocks, at the bottom of the ocean, in the Sargasso Sea.

Between the islands and Cape Verd was formerly assigned an immense bank of soundings, in the latitude of 19° and 20°, extending as far as 18° N. latitude, called the *Porgas Bank*, upon which was described, "a constant undulatory motion and rippling, causing a noise similar to that of breakers, arising from the action of the waters on the bank underneath." The existence of this bank is, however, much questioned, as many ships have recently passed over the position here assigned to it without getting soundings.

ISLAND OF BONAVISTA. This island, as its name implies, presents a beautiful variegated appearance, interspersed with scattered mountains, which terminate in low points to the water. It is the most dangerous of the Cape Verd islands, on account of its being surrounded by rocks and shoals, also the current setting directly on it from the N. E. Off the N. E. point of the island are some dangerous reefs, that extend 4 miles from the land, attached to three islets, called the Dutch, Braithwaite, and North Kays. Between these is sufficient depth of water for ships, in case of necessity, and anchorage under the lee of the reefs. The best situation is with Braithwaite Kay bearing N. E. by E., and Dutch Kay S. ½ W., or you may moor half a mile from the former in 6 or 7 fathoms, with the ground tolerably good. Mount Ochello, or Ochel, in one with the North Kay, will lead on to the north point of Hartwell reef, and the same mountain, due west, will lead to Braithwaite anchorage. The north side of Bonavista island has several sunken rocks about it, particularly between Broyal point and the N. W. reef and point; it will therefore be prudent to keep 2½ or 3 miles from land.

English Road lies on the N. W. side, and is a safe anchorage in fine weather. In proceeding for it, it will be proper to give the N. W. point of Bonavista a good berth, keeping a mile from the shore; and about 4 miles to the southward, you will perceive Small island, which forms the N. W. side of the road. It is common for vessels to haul close round

Small island, in 6 or 7 fathoms, passing between it and the 10 feet reef, by which they avoid the necessity of tacking for the anchorage: the best mark for the latter is, the town open with the N. E. end of Small island, and the highest part of the same island bearing about N. by E. The reef usually shows itself; but should this happen not to be the case, it will be better, particularly for a stranger, to go to the southward of it altogether, and endeavour to round it at the distance of 1½ or 2 miles from Small island, taking care not to get into less than 6 fathoms: and observe, after once opening the town, you do not shut it in again. The new town is on the middle of the bay, and the second reef *(New Town Reef)* lies to the westward of it, a short distance from the beach. The *Inner Reef* lies half a league to the northward, and is also near the shore. S. by W. 4½ miles from Small island, is Coral point, 2½ miles to the westward of which is Coral reef: this must be left in proceeding to the southward on the larboard hand, as the channel between it and the shore is not to be attempted. Vessels leaving English Road should steer W. S. W., and may afterwards proceed as they please.

The easternmost extremity of Bonavista is East Sand Head, to the southward of which is Brazen Hill point, which is remarkably bluff and perpendicular on each side, with a sandy beach. Somewhat better than 3 leagues to the southward is South island and point, both of which are low and foul. To the westward of this point is PORTUGUESE ROAD, where there is anchorage in 6, 7, or 8 fathoms, with Platform mountain or hill bearing N. N. W., the south point S. E., and the landing N. E. by N., distant 1½ mile. There is a reef that extends 3 miles off, from the point under Platform hill, with the sea breaking on it. The hill bearing E. N. E. clears this danger.

LETON REEF. This is a dangerous shoal, extending north and south, about one mile; from the centre of the reef the north point of Bonavista bears N. E. ½ N. (N. 26° E.) 9½ leagues, and the south point E. by N. (N. 64° E.) 7 leagues: it is about even with the surface of the sea, which breaks over it with violence, except in fine weather; and soundings have been found around it, as will be perceived on reference to our particular chart of the Cape Verd islands. The profusion of fish in its vicinity is incredible.

ILHA DE SAL, OR SALT ISLAND. This is a long narrow island, about 16 miles in length, and the north-easternmost of the Cape Verd islands. Its north-western part appears high and irregular; the hillocks and vallies extend down to the water's edge, both on the eastern and western sides, while its south and south-east points run out in long sandy spits, very low and flat, and scarcely distinguishable at a distance; at a little distance to the northward of the S. E., or Wreck point, is a rocky reef, stretching out about a mile from the land, on which the sea commonly breaks. Salt island may be seen a great way off, and the Peak of Martinez will become visible, on a clear day, at the distance of full 60 miles, its height being computed to be 1600 feet.

There are no places of anchorage on the east side of the island; but on its western side are two bays, Palmyra and Mordeira, the latter being considered one of the best among the Cape Verd islands. Palmyra bay is shallow, and only frequented for its supply of fresh water; this comes from a well, affording about half a ton per day.

MORDEIRA BAY is about 4 miles to the southward of Palmyra. In proceeding along the west shore of the island, from the N. W. point to Mordeira bay, you will have soundings all the way; within a mile of the shore are 15, 16, 17, and 18 fathoms; in Palmyra bay 5, 6, and 7 fathoms;

and close to Bird island 10 fathoms. Bird island is small, and lies about a quarter of a mile off the shore, but there is no passage for vessels to go between. Mordeira bay lies in to the southward of Bird island, and being surrounded by low land, it is not so subject to squalls, nor heavy swells of the sea, as the bays in most of the other islands are. Having rounded Bird island, your best anchorage will be with Bird island just shut in with the foot of the Lion's Head, distant 1¼ mile from the bluff land; observe there are many foul spots about, therefore care should be taken to ascertain the quality of the ground before you let go your anchor. The anchorage is safe during the N. E. breezes; you will ride in 15 or 16 fathoms, or lessen your depth by advancing towards the shore; the bay has plenty of fish and turtle, but there is no fresh water, nor could that article be procured by sinking casks in the sand.

From Mordeira bay to the south point of Sal is about 6 miles; there are soundings all the way of 6 and 8 fathoms half a mile off the shore. Soundings off Turtle point extend full two miles out, at which distance there are 20 fathoms. Vessels sometimes take a temporary anchorage off the south point in 7 fathoms, within half a mile of the land; but it will require you to be careful in going round the south point, for it is very low, and you should not come nearer than into 8 or 9 fathoms water. This island has numerous salt ponds upon it, where the water crystalizes into a beautiful salt, forming an article of commerce; the land is otherwise nearly barren, producing only a few inconsiderable shrubs.

MAYO. This island is about 4 leagues in length from north to south, rising most towards the centre. On approaching the island from the S. E. its appearance is very different from that from the northward, for you first descry two hummocks towards the north part, appearing like islands, but, as you approach nearer, the land is perceived by which they are connected. Southward of these is a mountain, with very low ground to the south, over which two hillocks are seen. At half a league from the middle of the north side of the island is a reef, extending N. N. E. and S. S. W. three-quarters of a mile, which must be cautiously avoided.

On the S. W. side of Mayo is a sandy bay, called ENGLISH ROAD, within which is the town with its extensive salt-pans. Ships may anchor here in 7 or 8 fathoms, west point N. N. W. (true) and south point S. E., from whence the land appears with three conical hills to the N. E. Fresh water is here extremely scarce, and by no means good. Abreast of the town, and to the eastward of it, the shore is steep, bluff, and rocky: but to the westward a low white sandy beach extends to a rounding point, from which a spit of sand and coral stretches outwards, at a short distance from the extremity of which there is no ground at 45 fathoms. The spit may be rounded in 16 or 17 fathoms, and a ship should not anchor further out than in that depth, the edge of the bank being steep. There is anchorage half a mile west from the town, in 11 or 12 fathoms.

ST. JAGO. This is the most considerable of the Cape Verd islands, and being the seat of government is better inhabited, and more frequented than the others; it is about 10 leagues in length and 5 leagues in breadth. The land is very high, and the eastern side is bordered with rocks, which lie near the shore, so that vessels may safely sail along at the distance of two miles. The S. E. part appears as a long low point, when seen from the northward or southward; and 7 miles S. S. W. from this point lies the east point of Port Praya. Between the two, but nearer, lies a bay which so much resembles Port Praya that many vessels have been mistaken, and nearly lost, as it is a dangerous place; at the bottom of it are several cocoanut-trees, and a few houses. Between this place and Port Praya the land is mostly perpendicular, and though the fort of Port Praya, which stands on a cliff, is a mark, by which the true bay may be distinguished, yet the surest guide will be, that the north or east point of the false bay is surrounded with breakers, whereas the east point of Port Praya is high, steep, and free from danger: you must haul close round the point, and keep within a cable's length of the shore, to go to the anchorage in 7 or 8 fathoms.

Port Praya is a fine bay, lying between two points, which bear from each other about east and west, one mile and a half apart. As you sail round the east point, (Point Bicudas,) you will soon open the forts at the bottom of the bay, to the westward of which, in a valley, are several cocoa-nut-trees, and a small house. The winds, except in the tornado season, are generally in the N. E. quarter, with frequent squalls; therefore a ship, on approaching the east side of the bay, should have her top-gallant-sails furled, and a reef or two in her topsails. The eastern shore of the bay is high, and all the land seems parched and barren; in the western part of the bay is a small black island, flat at the top, but rugged at each end, called the Isle of Quails, having a rocky projection from its south end, about half a cable's length; there is also a rocky ledge off the north end, where the water is in general shallow, for 3 fathoms is the greatest depth between this isle and the fort. Within, to the westward of the island, it is only navigable for boats.

From the west point of the bay, Punta de Tamaros, some rocks extend to seaward, which require caution to avoid, when sailing from the anchorage in the night. It is, therefore, more convenient to anchor nearer the N. E. side of the bay, than to the Isle of Quails, for the sake of more readily getting under sail, without running the risk of being carried by the currents upon the point of the rocks to the leeward, before the vessel has gained fresh way enough to steer clear of them. The best anchorage is in 7 or 8 fathoms, with the fort bearing N. W. by N. (N. W.) about three-quarters of a mile, the body of Quail's island west, and the point of the bay, opposite Quail's island, E. by S., the ground being coarse sand and gravel, but not holding well, consequently requiring a good scope of cable to bring the ship up: a kedge anchor should be let go to the west, in order to steady the ship, keeping the bower anchor clear when the wind is light from the west.

It has been observed, that "Quail island, though centrically situated, is too near the main land to assist any one in finding the anchorage. Do not approach on any point nearer than half a mile, as the vicinity is rocky, and some rocks do not appear above the surface."

The island of St. Jago, when bearing W. N. W. ½ W., 8 leagues, appears very high. Mount St. Antonio, rising out of its centre, is of a conical form, and terminates in a peak, which peak, bearing N. N. W., leads to Port Praya road; and as you advance westward, you will see the east end, which, as already has been observed, is very low. As a further guide, you will see an opening several miles north-eastward of the harbour, on Signal-post hill, which gradually slopes to the westward; also, Red hill, which is on the larboard side of the bay, N. by W. The town is situated on an eminence, rather high, and perfectly white, the houses being visible from S. by E. to S. W. by W.

It seldom rains here, but a dry haze is very prevalent. In December and January, the wind hangs sometimes far to the eastward, veering at times to the northward. In settled weather, there are often regular land and sea breezes in the bay; the sea breeze setting in near noon, and ending at 4 or 5 o'clock in the afternoon; the N. E. wind begins towards evening, and continues during the night.

Ships bound from Port Praya to Bonavista, should endeavour to sail in the evening, as the current at that time is favourable: they should not stand too far over towards the African coast, nor work between Mayo and St. Jago, and they will then get to the eastward very rapidly.

FOGO, OR FUEGO. This island lies 12 leagues to the westward of St. Jago, appearing like one immense mountain, rising out of the sea to a peak 7,000 feet high: it is the only submarine volcano, still smoking, and whose eruptions occasionally create sufficient alarm to oblige its inhabitants to retreat for security to the neighbouring islands. About 1½ league off the north end, there is said to lie a sunken rock; the whole of the eastern side is foul to one mile and a half from the shore, but the west side, on which the town is situated, is clear. This little town is named Luz, off which, north, by compass, distant a quarter of a mile, and the peak of the volcano E. N. E.; but the ground is foul, bay open, and the landing very bad. Corn, fruit, and cattle may occasionally be purchased here, but water is scarce, there being no running stream. The volcano may be sometimes seen at the distance of 34 leagues.

BRAVA. This is nearly an oval-shaped island, lying 8 miles to the W. S. W. of Fogo; in comparison with the great height of the latter, it appears low, although its land is high, and its mountains rise like pyramids, towering one above the other. About 5½ miles to the northward of Brava, are two rocky islets called Rombo, or Rome's islands, nearly connected with each other by a reef, but the passage between them and Brava is clear. Brava has several bays or roads, where a ship may anchor. The best of them, called Furna, lies at the N. E. end of the island, where small vessels may lie sheltered from all winds but the S. W. Along the whole coast there is generally a heavy surf, and landing is bad. Brava produces good water, and an abundant supply of live stock, corn, and fruit, but little wood. There is also an abundance of salt, and more saltpetre is procured here than on any of these islands. The natives are few, and all blacks; they are harmless, hospitable, and generous.

ST. NICHOLAS. The east point of this island is distant 19 leagues from the S. W. extremity of Sal. It lies in an east and west direction, about 8½ leagues, and is of a very irregular breadth. The east end appears like a sail, being a platform point, having a high pyramidal rock near it. About 4½ miles from hence is FRESHWATER BAY, where there is anchorage in 7 fathoms, half a mile from the shore. There is good landing for the boats, with plenty of good water in fine weather, and at neap tides; for as the tides rise here 5 or 6 feet, on the new and full moon, the pond is then overflowed. At this time you are subject to heavy squalls; and, notwithstanding the wind blows off shore, the sea is very high close to the beach. ST. GEORGE'S BAY, which is 12 miles to the westward of the latter, is known by its conic or sugar-loaf mountain, to the left of which there is another mount, with a flagstaff on the summit. Anchor on the north side, in 6 or 7 fathoms, close to the shore, by which a rocky ledge, which stretches from the east point, will be avoided: the best situation will be the sugar-loaf hill, bearing N. E. by E., the flagstaff N. W. by N., and the cove, or landing-place, distant a quarter of a mile N. W.

TERRAFAL BAY lies on the S. W. side of St. Nicholas, and has regular soundings within it, from 14 to 5 and 4 fathoms, near the shore, sandy bottom: the custom-house stands on the S. E. corner of the bay. Anchor in 15 to 10 fathoms, bringing the islands of Raza and Branco in one, bearing W. N. W. ¾ N., and the landing-place distant a quarter of a mile E. ½ N. From Terrafal bay to the west point of St. Nicholas, there are soundings from 40 to 20 fathoms, a short distance from the land: a vessel may anchor in 30 fathoms, a mile S. by W. from the west point, when it blows from the N. E., but that is the only quarter it is sheltered from. By digging a well, almost anywhere on the low land, you may water here, unless the rainy season has failed ; but there is always water in the valley, about half a mile from the sea, whence the natives will bring it down on asses for a trifle. From this road you may see, in clear weather, all the leeward islands ; but if it be in the least hazy, the isle Raza is not discernible.

RAZA, OR CHAON is distant 8½ miles to the westward of St. Nicholas. It is of a square form, about 2 miles in length, and 1½ mile broad ; it is of a rugged mountainous nature, and is uninhabited. The landing-place is under the N. W. point, facing the west. Between it and Branco, at about one-third from Raza, is a coral reef, extending S. S. W. and N. N. E., and having on its shallow part 6 fathoms of water, but deepening gradually on the west to 15, and on the east to 18 and 20 fathoms. The sea continually breaks over the reef, owing to a strong tide or current setting through between the isles.

BRANCO, OR REDONDA, is a long narrow island, about 2½ miles in length, of a similar description to that of Raza, from which it is divided by a channel of 18 to 6 fathoms, about 3 miles wide. There is no safe landing at Branco, as its shores are all rocky, more particularly towards the S. E. end, from whence there stretches a sandy spit.

ST. LUCIA. About 4 miles to the northward of Branco, lies St. Lucia ; between is a bank of soundings, forming, towards the latter, a regular flat of 10 to 12 fathoms. The south coast trends nearly east and west, 4 miles, and in the middle of it is a good landing-place. A steep bank, half a mile broad, stretches from it, having on its edge 2 to 4 fathoms. In the bay formed by the S. W. coast, small vessels may anchor, being sheltered from all points but the south and S. E. The beach is sandy ; the anchorage, small pebbles and sand. In the middle of the bay is an islet, named Leon, with the ruins of a village on it. The N. W. part of St. Lucia rises into high mountains.

ST. VINCENT. PORTO GRANDE, on the N. W. side of the island of St. Vincent, is considered one of the largest and best bays among the Cape Verds ; the anchorage is safe and good, and is sheltered both from wind and sea. The wind generally blows from the N. E. over a part of the land, and seaward it is protected by St. Antonio, which is distant about 8 miles. The church and custom-house stand at the bottom of the bay on the east, and a signal-post is erected on a hill a short distance from the anchorage. Without the entrance of the bay, at about two-thirds of a mile from its north-west point, is Bird island, which is very steep, and appears at a distance like a sugar-loaf; this may be passed on either side, and hence you will find regular soundings towards the shore. The ground is good in most parts of the bay, and you may anchor anywhere in 7 or 6 fathoms, sandy bottom. It is advisable to moor with a kedge, as a strong current often sets to the N. E. between Bird island and the shore.

ST. VINCENT is divided from St. Lucia by a channel 4 miles wide. The island stretches 12 miles east and west, and is about 7 miles in its broadest part. The N. E. coast forms two bays, separated by a low peninsula ; but as it is hereabouts altogether dangerous, it needs no further description. On the S. W. side of the island is the BAY OF ST. PEDRO, having a fine sandy beach, where vessels may anchor in 10 fathoms, near the middle of the bay, or rather more to the westward. The anchorage is good in the dry season, and the inhabitants say there is plenty of wood and water. On the eastern side of the island is another anchorage, the Praya de Gatta, with a sandy beach, near which vessels may anchor in 6 fathoms; the bottom is clear, but a sea sets directly in when the wind is either N. E. or S. E., the island of Santa Lucia sheltering between these points. This bay and coast are without wood, water, and inhabitants.

ST. ANTONIO. This island is divided from the former by a safe channel, 8 miles wide. St. Antonio is remarkably high, particularly towards the N. W., where there are two high mountains, the highest of which is called the Sugar-loaf, and is generally overcapped with clouds. The town and bay of Santa Cruz are situated on the S. E. side, but the anchorage is bad, with a spit on the side. Terrafal bay, towards the S. W. side, is well supplied with good water, and other necessaries may here be purchased.

St. Antonio may be descried, in clear weather, 18 leagues off, and appears high, bleak, rocky, and barren, which in fact it really is, even when you approach near to it. The S. W. point is pretty well covered with brushwood, but there is little appearance of verdure or cultivation.

WINDS, CURRENTS, &c. In the vicinity of the Cape Verd islands, the winds are generally from the north to the east, becoming light and variable as the sun approaches the zenith, accompanied with thick hazy weather, some distance from the land; but near which, in the bays and harbours, except during the rainy season, there are sea and land breezes,—the former blowing from 11 to 12 o'clock in the forenoon, until 4 or 5 in the afternoon, when the land-wind succeeds.

The *rains* commence about the middle of August, and continue without intermission until November; during which period the winds are strong from the South and S. W., with frequent heavy squalls; and it is during these months that the inhabitants are so oppressed with sickness and fatal diseases. Throughout the year, there is a constant atmospheric humidity, from which is deposited an abundant proportion of vapour, which circumstance accounts for the temperature of the climate, and the extreme luxuriancy of vegetation in these islands.

The *currents* in the neighbourhood are, for the most part, strong to the S. E., therefore, vessels bound from the north ought to make allowances accordingly, making the island of Sal first, from whence they may, with facility and greater security, direct their course to any of the others. The current, however, has occasionally been found to run to the N. E., in which case, serious errors will often occur, and which, perhaps, experience only can guard against. The force of the current is commonly three-quarters of a knot.

There is a certain proportion of the sea, 3 or 4 degrees southward, and 6 degrees to the westward, from the Cape Verds, extending to the equator, which seems condemned to perpetual calms and heavy rains, and which, in the words of Lieutenant Bold, may be accounted for in the following manner:—"The sun, in his course from east to west, occasions a powerful rarefaction of that proportion of the atmosphere immediately in his vicinity, causing a constant stream of wind, which rushes after him from the east, to supply and equalize the rarefied medium. This wind, crossing the continent of Africa, loses its power in traversing such an extensive heated body of land, and separates into two veins, which are termed the N. E. and S. E. trades; in consequence of which, the intermediate space, which is specified above, as far as the conflux of the winds, is in a constant state of inaction, receiving from every side the proximated passing clouds, which settle and deposit their waters with sometimes the most unabated fury.

"The motions of the two powerful elements, wind and water, are found to operate in exactly a similar manner; therefore, at the meeting of these winds, as at tides, there is an irregular motion caused, creating eddies, &c., which give rise to those sudden various gusts and rains, that vessels experience in traversing the equator from the N. E. to the S. E. trades, and *vice versa*."

Tides. It is high water on the full and change of the moon, among the Cape Verd islands, as follows:—English road, Bonavista, at half-past seven—tides rise 5 feet; Mordeira bay, Sal, at three-quarters after seven—rise, 5 feet; Port Praya, at six o'clock—vertical rise about 4 feet; St. Nicholas, at seven, and the tide rises 6 feet. Variation at St. Antonio, in 1826, was found to be 16°; at Port Praya, 14°, W.

THE BERMUDAS, OR SOMERS' ISLANDS.

These islands derive their name from the supposed discoverer, Juan Bermudez, a Spaniard, who is said to have touched there in 1522; or, as it is in May's account, from a Spanish ship, called Bermudas, being cast away there. The first printed account of them in English seems to be by Henry May, who, being on board a French ship, commanded by M. de la Barbotier, was wrecked on them, in 1593. The second and less common appellation is from Sir George Somers, who was driven upon them, in 1609, on his voyage to Virginia. They consist of a numerous group of islands and rocks, being surrounded with dangerous reefs, nearly even with the surface of the water, some of which extend 8 leagues to seaward, so as to render the access extremely difficult; in addition to which, the land is low, and a current frequently sets towards them from the S. W. The Bermudas extend N. E. by E., and S. W. by W., about 20 miles in length, and of various breadths, being shaped in the most irregular manner imaginable. Including the small ones, the number of islands is very great, but the large ones may be reduced to five, viz.:—St. George's, St. David's, Long island (or Bermuda), Somerset, and Ireland. There are two towns, each of which has its mayor and civic officers, St. George's, on the island of that name, to the N. E., and Hamilton, on the large island, (or continent, as it is generally called), about the centre of the group. They are both well built of white stone; St. George's, which is the larger, contains about 500 houses, a church, the town-house, (in which both branches of the legislature hold their sittings) a library, and other public buildings. The whole group is divided into nine parishes, each of which sends four members to the house of assembly. The scattered houses and hamlets are so numerous, that the whole island has the appearance of one continued village.

There are no springs or fresh water streams in the islands, and but few wells, the water from which is brackish; each house has its own tank, to which the roof serves as a conductor for the rain; and on the island of St. George's are large tanks for the supply of shipping.

The climate of the Bermudas is that of a perpetual spring, mild, genial, and salubrious; though during southerly winds, which are the most prevalent, the atmosphere becomes charged with a humidity unfavourable to constitutions predisposed to rheumatism, gout, or pulmonary affections. The fields and trees are always green; but the predominance of the cedar, while it refreshes the air with its fragrance, imparts its dark hue to the landscape. Snow seldom falls, and rains are not frequent, though heavy while they last. The islands are, however, very subject to tempests, thunder-storms, and hurricanes, especially during the autumn,—a circumstance that may be attributed to their situation on the verge of the trade-wind, where variable and disagreeable weather always occurs.

There is not an insular group on the whole globe so protected by nature, from the effects of a boisterous ocean, as the Bermudas. They are surrounded by dangerous rocky reefs, extending in some parts 10 miles from the islands, which render them very difficult of access. The few channels through the reef are thickly studded with coral rocks, but the water is so beautifully clear, that they are visible to the eye; and the Negro pilots, looking down from the bow of the vessel, conduct her through the labyrinth with a skill and confidence only to be acquired by long habit.

There are four SIGNAL STATIONS on the islands—one at St. George's, the head quarters, on the east; another at Mount Langton, near Hamilton; another on the S. W. coast, at three miles from the S. W. end of the islands; and the other at Gibb's hill, on the west coast. At each a small party of soldiers is stationed. There is also a flagstaff at the commissioner's house, in the dock-yard in Ireland's island, which communicates with Mount Langton, and through that to the other stations. The population is between 9,000 and 10,000, something more than half of which are whites, of whom nearly two-thirds are females.

SAILING DIRECTIONS. In running from the eastward for these islands, the best parallel is between 32° 10′, and 32° 20′; a ship may then run on boldly, as there are no rocks at any distance from the land. With a large wind, and approaching land towards the night, no vessel should lie-to, but rather turn to windward under an easy sail till morning, as the current may take you unexpectedly among the rocks. It is also to be observed, that the islands are low, and cannot be discerned far; added to which, a thick haze is often prevalent. Under these circumstances, it will at all times be proper to be correct in ascertaining your latitude, as making the land is somewhat difficult, and at times precarious.

As the prevailing winds in these seas are commonly between the south and west, vessels from the westward generally run for these islands, in about the parallel of 32° 8′. Steering east, the first land seen will be Gibbs' hill to bear E. N. E.; and when within 6 miles of the land, take care it is not to the eastward of that bearing, because of the rocks called the Long bar. Steer then so as to pass within two miles of the S. E. land, and when Wreck hill shuts in behind the south land, you are clear of the S. W. breaker, and may steer along the S. E. side, at a mile distant from the shore, until abreast of St. David's head.

On coming from the westward, the S .W. points of the land ought to bear E. N. E. before you come within 4 leagues of the land, when you may steer directly for it without danger. The breakers on the south side always show themselves, so that a ship may safely approach within gun-shot, from the S. W. end to the S. E.; and when getting to the eastward of the castle round into St. George's, do not go further to the northward than to keep Cooper's island open within St. David's head, till you take a pilot.

The rocks and islands of Bermudas lie N. E. by E. and S. W. by W., about 9 leagues, and in breadth about 5. Wreck hill forms the west point, and St. David's head the east. The W. N. W. and North sides are encumbered with a dangerous and continued ledge, beginning at the Long bar, the south part of which lies 6 miles W. S. W. from Gibb's hill; trending then N. E., it is called the Chub heads, which off Wreck hill lies 9 miles from shore; it thence extends to the North rock, and rounds East and E. S. E. to Mill's breaker, which dries at low water, and lies N. E. 6 miles from Catherine point. There are soundings round the outer edge of this ledge from 9 to 14 fathoms. There are soundings also 2 miles from the shore, round the N. E., East, and S. E. sides of the Bermudas; and as the water hereabout is deeper, vessels suspecting themselves in the vicinity of the islands, would do well to keep the lead going, being assured that at 13 or 14 fathoms, they will strike the ground in time to avoid danger.

MURRAY'S ANCHORAGE lies on the S. W. side of Catherine point, extending from Tobacco bay to the ferry: the common entry is through an intricate narrow passage round the point; the ground consists of stone of the drip-stone kind, as fine as flour, mixed with a shelly substance and chalky clay, and is very heavy. In the event of not getting a pilot off Castle harbour, you may run as far as St. David's head; and when to the eastward of which, stand no further northward than to bring the head to bear N. E., or you will see a white sandy bay to the southward of the head, between it and Castle harbour. In standing to the northward, care must be taken to shut no part of this bay in behind St. David's head. The west land of Bermudas will be shut in behind the land over this bay, before this mark comes on. In the night, when waiting here for a pilot, the best precaution is the lead, for, if care be taken, and the ship is not running too fast through the water, you will be sure of striking ground in time to avoid danger. There is a rocky bank, lying from S. S. W. to S. W. from Gibb's hill, from 3 to 5 leagues distant, with various depths of water, from 16 to 40 and 45 fathoms.

The following particulars are extracted from Cotter's Sketches of Bermuda, 1828. "The principal places of anchorage are St. George's Harbour, with a bar, over which at high water spring tides are 19 feet, but deep enough within that for ships of any burthen. Murray's Anchorage, extending from St. Catherine's point to the ferry, the entrance to which is very intricate, but is well marked with buoys; this is the channel to *Grassy bay*. Off the dock-yard, in Ireland island, is the general rendezvous for H. M. ships; and also Hamilton, situated at the head of the Little sound." Castle harbour was formerly the place assigned for men-of-war, but this has been discontinued since the loss of the Cerberus frigate, which struck on a rock, in endeavouring to get out to chase an American privateer.

"Ships may approach within a mile of the land on the south side, there being no hidden danger; but on the north side there is a reef of coral, about 3 leagues from land, extending from the North rock, bearing true North from St. Catherine's, to the western extremity of the colony. There is, however, a passage through, abreast a point called *Wreck hill*, in Somerset parish, which is only frequented by vessels of light draught of water. There is also a passage near the North rock, but which is never resorted to except in cases of great necessity.

"Many skilful mariners and pilots are of opinion that Grassy bay is not well chosen as an anchorage for H. M. ships. The channel from St. Catherine's point is almost daily reduced in width and depth of water, owing to the influx of sea-weed into the Great sound, and the rapid growth of coral; besides, ships have been detained several days, in consequence of the wind not answering, to enable them to get through the intricate channel from Murray's anchorage.

"No stranger of common prudence would attempt any of the anchorages without a pilot, many of whom are always on the look-out, and put to sea when a vessel heaves in sight. Their boats are easily known, being of a peculiar construction and rig. They are of a light draught of water forward, but have what is called a long heel or deep stern-post, and are rigged with one mast and bowsprit, carrying a triangular mainsail, a foresail, and jib, and occasionally a gaff topsail and square-sail."

TIDES. It is high water, on the full and change, at St. George's, at 8 o'clock; spring tides rise about 6 feet, common tides only 4 feet. The tides are various, both in height and time, at different parts of the island. The Variation is 2½° W.

SECTION III.

ROCKS, SHOALS, AND DANGERS, IN THE NORTH ATLANTIC OCEAN.

☞ *The Notes referred to will be found subjoined.*

NAMES.	NORTH LAT.		WEST LONG.		REMARKS.
	DEG.	MIN.	DEG.	MIN.	
To the N. of 40°					
Kramer's Bank,	59	45	16	40	Doubtful. *Vide Note* 1.
Rockall,	57	40	13	31	Two leagues E. N. E. ½ E. of Rockall is Helen's Reef. *Note* 2.
Lion's Bank,	56	40	17	45	Soundings obtained by Lieut. Pickersgill, 1776.
Vigia,	56	30	16	0	Doubtful.
Aitkin's Rock,	55	19	9	58	Doubtful. *Note* 3.
Brasil Rock,	51	10	16	0	A high rock, steep-to, seen in 1791.
Negre's Rocks,	48	7	21	0	Position not accurately determined.
Three Chimneys,	47	54	29	40	Supposed to lie in the position here stated. *Note* 4.
Chapelle Rock,	47	43	8	4½	Seen in 1786 and 1842. *Note* 5.
Jaquet Island,	46	50	39	30	Supposed to be an Iceberg.
Devil's Rocks,	43	36	13	8	Seen in 1829 and 1842. *Vide Note* 6.
Virgin Rocks,	46	26½	50	56½	Ascertained in 1829. *See Note* 7.
Maida,	46	10	19	40	Considered doubtful.
Mariners' Rock,	46	0	29	37	Seen in 1831. *Note* 8.
Barenethy's Rock,	45	42	37	25	Doubtful.
I. Verte, or Green Ild.	44	52	26	25	Said to be last seen by Capt. Coombes, ship Pallas.
Rock,	44	38	11	42	To the N. W. of Cape Finisterre, doubtful.
Five Heads,	44	15	19	25	Very doubtful.
Greeve's Rocks,	44	15	25	5	Position uncertain.
Vigia,	44	0	39	20	Doubtful.
Indemnity Rock,	43	20	25	10	Ship Indemnity, September, 1829. *Note* 9.
Cashe's Ledge,	43	1	69	10	A dangerous reef, half a mile in extent.
Vigia (Ramigeaus),	42	45	37	25	Probably not in existence.
Vigia,	42	45	37	16	Doubtful.
Beaufort Bank,	42	37	41	45	*Vide Note* 10.
Amplimont Rocks,	42	31	24	3	Position not well determined. *Note* 11.
Druid's Reef,	41	19	41	35	Discovered in 1803. *Note* 12.
Perseus' Shoal,	41	3	22	30	Ship Perseus, 1813, breakers seen.
Hervagault's Breakers	41	2	49	23	*See Note* 13.
Daraith's Rock,	40	50	54	53	Longitude uncertain.
Gough's Rocks,	40	28	33	0	Seen by Captains Gough and Birch.
Shoal,	40	26	36	10	Uncertain.

NAMES.	NORTH LAT. DEG. MIN.	WEST LONG. DEG. MIN.	REMARKS.
Shoal, ...	40 22	42 50	Doubtful.
Watson's Rock, ...	40 18	53 40	Captain Watson, 1824. *Note* 14.
Shls. of St George's Bk.	....	....	*Vide Note* 15.
BETWEEN 20° & 40° N.			
Candler's Rock, ...	39 47	35 0	Supposed to be an Iceberg.
Breton's Rock, ...	39 40	41 35	Position not well determined. *Note* 16.
Hume's Reef, ...	39 0	64 20	Brig Joseph Hume, 1827. *Note* 17.
Whale Rock, ...	38 46	25 0	Breakers seen, 1809.
Vigia, ...	38 30	38 15	Situation uncertain.
Princess Elizabeth Shl.	38 16	39 49	West of the Azores. *Vide Note* 18.
Vigia, ...	38 15	34 0	S. W. of Flores considered doubtful.
Rocks near the Azores,	37 56	33 4	Brazilian Brig Constante, 1840. *Note* 19.
Tulloch's Rocks, ...	37 27	24 45	Discovered in 1808, *Note* 20.
Formigas (the middle)	37 17	24 54	North eastward of St. Mary.
Jean Hamon's Rock,	36 54	19 49	Doubtful.
Dædalus' Rock, ...	36 30	9 16	Position very doubtful. *Note* 21.
St. Mary's Bank,......	36 0	27 16	Shoal of white water S. W. of St. Mary.
Kutusoff Bank, ...	34 50	23 33	West of St. Mary's bank, 1816.
The Eight Stones, ...	34 45	15 55	Doubtful. *Note* 22.
Ashton Rock, ...	33 48¾	71 41½	Capt. H. B. Grey, 1824. *Vide Note* 23.
Desertas (north end),	32 36½	16 33	Ten miles to the eastward of Funchal.
Steen Ground,.........	32 30	21 15	Westward of Madeira, doubtful.
Rocks eastward of Bermuda, ...	32 20	57 30	Position questionable.
Josyna Rock, ...	31 40	23 45	Supposed to be seen in 1805.
Vankeulen's Rock, ...	31 30	36 50	Doubtful.
Vigia, ...	30 53	27 12	Doubtful.
Harcourt Rock, ...	30 49	78 27	*Vide Note* 24.
Cleveland Rock, ...	30 45	10 24	Off Cape Geer, 9 leagues from land.
The Salvages (md. pt.)	30 8	15 48	Twenty seven leagues N. of Teneriffe.
Gandaria Reef, ...	29 30	37 18	*Note* 25.
Mourand's Bank,... ..	24 34	65 10	Capt. Mourand of Nantes, 1773.
Staminea Rock, ...	24 20	64 50	Doubtful, probably the foregoing.
Livington's, or Tulloch's Overfalls,	24 11	61 44	Capt. Tulloch, 1819.
Gombaud's Rock, ...	23 15	32 20	Gombaud, 1760.
Superb Bank, ...	21 0	69 8	N. E. of Silver Kays.
Three Kays, ...	20 41	70 10	Brig Augusta, 1829, 15 miles N. W. of Silver Kays.
Guigon's Bank, ...	20 48	66 43	Forty-five leagues to the northward of Porto Rico.
Navy Bank, ...	20 10	68 50	Seventeen fathoms S. E. of Porto Rico.
Hanna's Breakers, ...	20 0	63 45	To the northward of Anegada.
BETWEEN THE EQUATOR AND 20° N.			
Maria Rock, ...	19 45	20 50	Doubtful. *Note* 26.

NAMES.	North Lat.	West Long.	REMARKS.
	DEG. MIN.	DEG. MIN.	
Bom Felix,	19 15	20 40	Shoal of 4 and 5 feet N. W. of Cape Verd, doubtful. *Note* 26.
Clowes' Reef,	19 15	65 50	Caledonia, Capt. Clowes, 1825.
Betsey's Rock,	18 7	50 0	Seen by the Betsey, 1808.
Martin's Reef,	16 44	58 50	Supposed to be two miles in extent, 1823.
Bonetta Rock,	16 30	20 30	Doubtful. *Vide Note* 26.
India Shoal,	16 7	27 23	Position uncertain.
Maalstroom,	16 0	37 4	Uncertain.
Galleon's Bank,	15 56	49 40	Discovered by Longueville, the pilot of the San Fernando. 1730.
Leton Rock,	15 48	23 13	Dangerous reef even with the water.
Webb's Rock,	15 45	21 15	Doubtful.
Dulrueil's Rock,	14 50	29 40	Ditto.
St. Esprit Reef,	14 37	58 59	French ship St. Esprit, 1817.
Garcia Rock,	13 0	29 50	Doubtful.
Galissioneres Rock,	12 10	54 50	Somewhat doubtful.
Texeiros Shoal,	12 0	33 28	Supposed to be seen in 1810.
Five Palmas or Hinman's Shoal,	12 0	27 20	Doubtful.
Patty's Overfalls,	11 0	24 30	Ditto.
Delaware Shoal,	10 37	60 3	Eastward of Trinidad. *Vide Note* 27.
Hannah's Shoal,	10 7	27 32	Brig Hannah, 1824.
Longchamp's Rock,	9 47	30 0	Doubtful.
Warley's Shoal,	5 4	21 25	Ship Warley, 1813. *Note* 26.
French Shoal,	4 5	20 35	Doubtful. *See Note* 26.
Cæsar's Breaker's,	2 0	22 18	Considered very doubtful.
Blaesdale's Reef,	0 57	41 6	*Vide Note* 28.
St. Paul, or St. Penedo St. Pedro,	0 55	29 19	A group of five steep craggy rocks *Note* 29.

NOTES ON THE PRECEDING TABLES.

1. KRAMER'S BANK is said to have been discovered by Captain Alof Kramer in 1751, but Captain Ross sought for this bank, unsuccessfully, in 1818. "Continuing our course," says he, "on the 8th of May, to a spot where a bank is laid down in Steel's chart, as discovered by Alof Kramer, we could find no soundings in 130 fathoms, anywhere on or near the place."

2. ROCKALL. This rock has been seen many times, but its true situation was unknown till the year 1810, when it was ascertained by Mr. T. Harvey, master, and the other officers of the Endymion frigate, commanded by the Hon. T. B. Capel. It is a large high rock, of a conical, or sugar-loaf shape, the summit, or upper part, of which is perfectly white, from an immense quantity of birds' dung, with which it is covered.

3. AITKIN'S ROCK. On the 16th of July, 1740, at seven o'clock at night, in a passage from Virginia, on bord the Friendship of Ayre, John Aitkin, master, James Lockhart, mate, coming in at the N. W. channel of Ireland, going under reefed foresail, wind at N. N. W., steering E. by S., saw by the weather-leech of the foresail, a rock under water, about 4 feet, distant 40 or 50 yards, to the best of their judgment, the ship running 6

knots by the log, with a heavy swell from the N. W.; all hands being on deck saw it plainly: next morning made the land, between Ennistrahul and Tory island, at about 8 o'clock; supposed to lie in the lat. of 55° 18′ N. and long., from the meridian of London, 11° 14′ W. From Tory island W., distant 94 miles, without allowance of variation.

We have other accounts of this rock; and of these one states its position at 55° 15′ N. and 10° 40′ W., a part appearing at 3 feet out of water, with soundings of 30 to 40 feet a short distance; at 30 fathoms off no soundings with a line of 150 fathoms. In or about the year 1804, Captain Clarke, since of the Harmony of Ayr, believes that he saw the rock very distinctly; by his run, it appeared to lie 20 leagues nearly true west from Tory island. Captain James Reid, of the True Briton, says, "On Wednesday, the 27th September, 1826, when steering E. S. E., a man at the mast-head called out that there were breakers close to our larboard bow. I immediately hauled the brig up S. S. E. to clear them. In the run of the sea, a rock appeared a little above the water, nearly flat, about 90 feet long, and 40 broad; saw no breakers excepting round the rock, and could distinctly see the sea working over the rock. We sailed from the rock 11 miles S. S. E. per compass, and ob. m. latitude 55° 17′ N. We then bore up E. S. E. 36 miles, and E. by S. 6 miles, when Tory island bore per compass S. W. ½ W. 1½ mile."

H. M. S. Gannet was sent to examine this danger in 1824; the Harrier and Badger in 1827; and the Pylades and Dispatch in 1829; but the rock was not discovered. Again, in 1830, the Onyx and Leveret, two gun-brigs, commanded by Lieutenants Dawson and Worth, and directed by Captain A. T. E. Vidal, were engaged on this service. "They put to sea on the 6th of June, when the moon was at the full, and, commencing their examination at Tory island, proceeded nearly along its parallel of latitude to the westward of all the given positions of the rock. The two vessels were always in company, and the general practice was to sail on parallel lines, distant from each other one mile to one mile and a half by day, and, closing at night, to half a mile, or as much less as the state of the weather rendered necessary. During the few hours of darkness experienced at that season of the year, the vessels were hove-to, that no part of the suspected ground might be passed unseen, and the leads were kept going, both day and night, from the depth of 150 to 200 fathoms. Their distances from each other were determined every hour, by the angle of elevation subtended by their respective masts, at the heads of which balls had been placed to facilitate the measurement. Their mutual bearings were taken at the same time; and men were kept constantly at the mast-heads during the day, and a vigilent look-out preserved through the night.

The parallel of latitude of Tory island, as above mentioned, was first carefully examined, to the westward of all the positions of the rock, and then traversed back again. These runs were laid down on the chart, and then other lines traced, until the whole space was explored, as there exhibited. This system of crossing and re-crossing over every part of the suspected ground, was persevered in, until the 31st August; when, having visited every position assigned to this danger, and indeed the whole space comprehended by them, without seeing any rock, or discovering any detached bank, which could indicate its having existed, the search was relinquished, and the vessels returned to England."

4. THREE CHIMNEYS. Mr. Heron, of Greenock, in 1824, says, "I am informed by the master of a merchant-vesssel, that the Chimneys actually exist, for a whole watch as well as himself saw them. They were seen about twilight, and three heads were distinguished. From an obser-

vation taken at the preceding noon, it was inferred, that their latitude, as laid down on the chart, is very near the truth."

5. CHAPELLE ROCK. ABSTRACT FROM THE LOG OF THE BRIG GRACE DARLING, OF LIVERPOOL, JAMES TASKER, MASTER. "9th August, 1842. At 1 h. 30. m. P. M., breakers seen close to the vessel, and a sunken rock observed distinctly and repeatedly above water, in the hollow of the sea, which clashed together and broke much. Supposed the rock might be about 4 feet below the usual sea level. It was witnessed by the whole crew of the vessel, which passed within her own length to windward of it, then going about 7½ knots. Supposed it to be the Chapelle rock, of 1786; its circumference appeared to be about 40 feet; it was of a sandy colour, like freestone, and no weed appeared on it. All on board were much alarmed. Latitude *in*, carried on from a good meridian observation, 47° 43′ N., and longitude, reduced from chronometric observations, at 9 h. 30 m. A. M., and 3 P. M., 8° 4′ 30″ W. The chronometer was No. 2050, by Mr. Henry Frodsham, from whom her rate had been obtained only nine days before, and its accuracy subsequently confirmed by excellent distances of sun and moon, on the 27th August; and again by making Descada on the 5th September. So the existence of the rock in the assigned position may be relied on."—*Nautical Magazine*, 1843, *page* 48.

6. DEVIL'S ROCKS. CAPTAIN HENDERSON, of the ship Fortescue, on a voyage from the island of Mauritius to London, in 1829, states, "On the 25th of April, steering N. E., close hauled, after experiencing contrary winds for several days, about 4 P. M., while observing the sun's altitude for chronometer, I was alarmed by a cry of 'a rock on the lee-bow.' I immediately ran to leeward, and observed a rock of a brown colour, about 12 feet long, and nearly as much in breadth, about 2 feet above water. We observed the water to recede around it. Being rather squally, and fearing that some other unknown danger might be around us, prevented me from sounding. The latitude, at 4 *p. m.*, carried on from meridian altitude that day, was 46° 33′ N., and mean longitude, by lunar observations the same morning, by the sun, moon, and chronometer, was 13° 2′ W. As these things are considered imaginary, I only have to observe that this danger certainly exists very near the position mentioned."

Subsequently to the above being made public, another captain writes from Madeira:—"On the day I sailed from Liverpool, it was published in the Mercury, that the Devil's rocks, which had not been seen since 1764, had been discovered by the Fortescue, of Dublin, and stated to be in latitude 46° 33′ N., longitude 13° 5′ W. This determined me to look out, and I accordingly discovered them when within two miles of them. We saw the water breaking upon them, very high, and as it receded, the rocks were discernible; we were going nine knots at the time, and had the wind not been very strong, I do not think they would have been observed. In fine weather, I am of opinion that the water would not break upon them. I did not heave to, when I neared them, to take an observation, but made one soon after; and from the distance we had ran, I made them lie in latitude 46° 36′ N., longitude 13° 8′ W., being nearly the same as the Fortescue. These rocks lying directly in the track of ships bound into the English Channel, this information should be made as public as possible."

EXTRAÇT OF A LETTER FROM LIEUT. SPRIGG, COMMANDING H. M. S. BRISK, 1842. "Sir,—I have the honour to add, that H. M. brig under my command, on the 6th of August, was distant from the Devil rock, at noon, thirty-five miles, and, doubting its existence, I shaped a course directly for it. At 7 P. M., whilst looking over the taffrail, my attention was suddenly attracted by a change in the colour of the water under the ship's counter, which had been of a blackish green. On looking over the starboard quarter, the change to whitish green was more vivid, extending in a N. N. W. and S. S. E. direction for a mile and a half, its greatest width, close to our wake, about three-quarters of a mile, having very irregular and indented sides, in bold outline with the dark water surrounding it. A heavy swell from the north-west seemed smoother over the patch, without any visible break; but that it was a shoal, no doubt exists on my mind, or on many that saw it. The mast-head man unfortunately did not report it, though he admits having seen it three miles before reaching it, and about the same before he lost sight of it astern. From the deck, in about fifteen minutes it disappeared, preserving its shape and colour to the last.

"The sun was 6 or 8 degrees high at the time, the vessel going 8 knots; and as we had no more than four days' provisions on reduced allowance, I did not feel justified to return and sound, nor would I have attempted to pass over it in the brig. Its situation by our reckoning, deduced from afternoon sights, by the sea, and the planet Jupiter, places the spot in latitude 46° 12′ N., longitude 15° 3′ 30″ W."—*Nautical Magazine for* 1842, *page* 793.

7. VIRGIN ROCKS. We are happy in being enabled to state the result of the observations of Captain Bishop, of H.M.S. Manley, and Mr. Rose, master of H. M. S. Tyne, then commanding the cutter Inspector, both of whom returned to St. John's, on the 9th of July, 1829, after a second attempt (in which they were successful) to ascertain the actual situation of the *Virgin Rocks*:—The bank, on which the shoal is situated, extends E. by N., and W. by S., 4½ miles, its broadest part 2¾ miles; the soundings are regular, from 28 to 30 fathoms, deepening suddenly on the outer edge to 39 and 42 fathoms; the rocks are in latitude 46° 26′ 33″ N., longitude 50° 56′ 35″ W. extending in an irregular chain S. W. by W., and N. E. by E., 800 yards, varying from 200 to 300 in breadth; the least depth of water is on a white rock, in 4½ fathoms, with 5 to 6½ fathoms all around it, the bottom distinctly visible. Towards the extremities of the shoal are several detached rocks, of from 7 to 9 fathoms, with deep water between, and a current setting over them, W. S. W., one mile an hour, with a confused heavy swell.

8. MARINER'S ROCK. Extract of a letter from Mr. Swinton, master of the ship Mariner, from London to Miramichi, dated 11th of May, 1831:—

"At 9 A. M., on the 20th of April, we had a very narrow escape of being lost. The ship was laid to the wind, under a close reefed main-topsail and main-trysail, in a heavy gale from the westward, and a high sea, when we saw the sea breaking on something to leeward, not more than 50 or 60 yards from the ship, which we at first took for a vessel bottom upwards; but on nearing it, it could plainly be seen to be a large rock, about 60 feet in length, ragged at the top, and high at one end, with weeds growing on it. We set the fore-trysail, and just cleared it not more than thirty yards' distance. By the observation at noon, and longitude by chronometer, it lies in latitude 46° 0′ N., and longitude 29° 37′ W., not laid down in the chart, and I think will only be seen when there is a heavy sea running; but we could see it very plainly in the hollow of the sea. The south end appeared to be the highest part of it. Sights were obtained for the chronometer at half-past 9, and the meridian observation was very good."

9 INDEMNITY ROCK. "The ship Indemnity, at sea, at 3 *p. m.*, discovered a rock on the starboard beam, distant about three ships' lengths;

they were then going at the rate of about 2½ miles an hour, with a heavy swell from the N. W.: with each succeeding swell, it was entirely covered, but at intervals it showed several feet above water, and perfectly perpendicular. From the mast-head, it was seen to a great depth below the water, and appeared to be in the shape of a cone. At the preceding noon, our latitude, by obversation, was 43° 20′ N., and longitude, by chronometer, 25° 10′ W." Signed, R. WOODALL, master; F. E. CHALMERS, mate.—*Times Newspaper*, 19*th September*, 1829.

10. BEAUFORT BANK. LIEUT. A. SAINTHILL, R. N., commander of the ship Beaufort, lately returned from Jamaica, informs us, that on the 3rd of August, 1832, when in latitude 42° 37′ N., and longitude 41° 45′ W., he observed the water to be discoloured; in consequence of which, he tried twice for soundings, and found rocky ground at the depth of 100 fathoms. Lieut. Sainthill is also of opinion, that soundings might be found from the meridian of 20° W. to the banks of Newfoundland.—*Nautical Magazine*, 1832, *page* 393.

11. THE AMPLIMONT ROCKS. Extract of a letter received from CAPTAIN THOMAS ALDERSON, of the Morning Star:—"On the 13th of May, 1842, I sailed from Paimbœuf for Quebec, with the wind at N. E. We had a fine run to long. 19° 44′ W. On the 23rd of May, (at noon, in lat. 42° 31′ N., by two good observations, and long. 24° 3′ W.), at 7 *h.* 20 *m.* P. M., I passed a rock within two ships' length. When I first saw it, it was a little before the larboard beam, and appeared like a ship's anchor-buoy. When it came on the quarter, I saw the sea-weed quite plain upon it, as did also the watch on deck. Another part of the rock we saw under water, about 8 or 10 feet from the rock we saw above water; at intervals it was covered and uncovered, We had not much swell on at the time; fine pleasant weather. At the time of passing the rock, the ship was in lat. 42° 51′ N., and long. 24° 15′ W. The rock was seen a considerable time after we passed it. Wind at the time, W. N. W.; ship's head north, going 3 and 3½ knots per hour."

In M. Bellin's Memoir, of 1742, a danger is mentioned in lat. 42° 30′ N., and long. 24° 5′ W., which was seen in 1735, by M. Guichardi, commander of the ship Dauphin, of Nantes. It has two points of rocks, separated, and 30 feet above water. He ascertained the height within a league of the danger, which appears to be the same as that called *La Basse d' Amplimont*, stated to be nearly in the same latitude and longitude. Some Englishman has called it by the name of Edmund Knowles' rock, by whom it is supposed to have been seen.

These rocks, appearing like the two masts of a brig, and nearly in the position assigned, were seen by Captain Mills, in the brig *Tamer*, early in 1829.—*Nautical Magazine*, 1842, *page* 792.

12. DRUID'S REEF. This reef was heretofore inserted from the late Spanish chart, as seen in 1803, lat. 41° 24′ N., and long. 41° 20′ W.; but the authority under which it had been there introduced we cannot inform our readers. On the 12th of April, 1831, Captain Treadwell, in the Druid, of London, passed this reef on his starboard hand, at not more than 30 yards distant. The weather was calm, and he had taken a good meridian altitude; whence the latitude was assumed to be 41° 19′ N., and the longitude by chronometer, which has always proved correct, 41° 35′ W. The reef had the appearance of from seven to ten sugar-loaf heads, and its length from E. N. E. to W. S. W. was estimated at from 10 to 14 feet. It was about 3 feet above water.—*Nautical Magazine*, 1832, *page* 12.

13. HERVAGAULT'S BREAKERS. On the 12th of May, 1827, Captain Maxwell, of the ship Home, on his passage from Liverpool to

New York, fell in with three sunken rocks, with a tremendous sea breaking on them, apparently from 4 to 6 feet under the surface, in lat. 41° 2′ N., and long. 49° 23′ W., and about 30 feet in circumference; the last of them tailed off to the N. E. with a long ledge. Winds, at the time, W .S. W.; ship's head N. W., going 7½ knots per hour. Captain Maxwell says, "The chronometer I have with me can be depended upon to one mile, and the latitude and longitude I have given is correct." This shoal is the Hervagault's breakers of the French charts. In 1816, it was seen by Captain Lourp, of the brig Alexander Savage, who places it in latitude 41° 6′ 23″ N., and longitude, by dead reckoning, 49° 57′ W.

14. WATSON'S ROCK. The particulars of this danger are thus communicated by Captain Watson:—"April 20th, 1824, at 8 *a. m.*, being on the starboard tack, ship going 2½ knots an hour, moderate weather, a man saw something a-head; the helm was immediately ordered a-weather to clear it, being very near it; ship was only 15 or 20 fathoms to leeward of it, which enabled me distinctly to make it out to be a rock, just even with the water. Its head was round, and appeared to be about 3 fathoms or more in diameter; it was of a light green, with some branches of a red colour. It was at times, on the top of a sea, invisible, but in the hollow of a sea, several feet uncovered. From an excellent observation at noon, I consider it to lie in lat. 40° 18′ N., long. by dead reckoning, 53° 40′ W."

15. ST. GEORGE'S BANK. This bank was regularly surveyed in 1821, by the United States' schooner Science, and the sloop Orbit, under the orders of Captain Isaac Hall. The following description is a copy of his report. "There are properly four shoals on St. George's bank; the whole of them are included between the latitudes of 41° 34′ N. and 41° 53′ 30″ N., and longitudes 67° 18′ W. and 67° 59′ W. Between them are from 15 to 35 fathoms of water.

"The largest, and on which is the greatest danger, is the most southerly and westerly. It is somewhat triangular, with a long and narrow spit, running out from the S. E. angle. The S. E. point is in latitude 41° 34′ N., and longitude 67° 40′ W. The west point is in 41° 42′ N., and longitude 67° 59′ W. The N. E. point is in latitude 41° 48′ N., and longitude 67° 47′ W. The eastern side of the shoal, although somewhat irregular, runs nearly S. S. E. and N. N. W., having on it from 3 feet to 9 fathoms at common low water. This appears to be what is commonly called the Malabar bank; it is composed of a great number of sand-spits, very narrow, so that the width of a narrow vessel will make several fathoms difference in the depth of water. The general range of the spits is from S. E. to N. W. As there are no rocks, they are consequently liable to change, in some measure, their position and ranges. On their eastern edge, even in calm weather, unless it be either high or low water, the tides run with great rapidity, and form considerable breakers, when setting to the westward. This is accounted for by a knowledge of the fact, that directly on the edge of this shoal, there is from 12 to 16 fathoms of water, so that the edge forms a sort of dam, stopping the force of the flood tide, and over which the ebb falls down.

"When there was any considerable wind, we observed that the breakers were higher within the edge, to the westward, than on the edge; and there is no doubt that the water there was still shoaler, and that we should have seen the sand, had it not been for the heavy sea. The breakers were such, unless it were entirely calm, that it was impossible to go among them with boats. Nor was it considered safe to attempt with vessels; for, besides the danger of striking on the hard sand-spits, the vessels would have been liable to have been filled by the breakers. Even on the eastern edge, and at nearly slack water, the vessels were, at times, nearly covered with them. It was therefore not thought necessary to attempt it, as the object of the survey,—to ascertain if there was danger on the shoals, and the situation and extent of this danger,—could be accomplished without the risk. Had not the sea been very smooth, and at high water, we should not have been able to have gotten on where we found only 3 feet, when reduced to low water. The prevailing wind was to the eastward; and I have no doubt that this place would have been bare, with any continuance of an off-shore wind. I think there are no rocks about the shoals. We had one cast on the S. W. side, which indicated rocky bottom, in 15 fathoms, but I believe it to have been some sharp stone that the lead struck upon.

"The centre of the northern shoal is in latitude 41° 53′ 30″ N., and longitude 67° 43′ W. It extends east and west about 4 miles; the shoalest part, having 6 fathoms, is very narrow, and composed of hard sand; but there is not more than 12 fathoms of water for 3 miles to the southward of the above latitude. On the north side, at two cables' lengths from the shoal, the sloop dropped into 33 fathoms. The breakers on this shoal are very heavy, and when there should be a sufficient sea to endanger a vessel, they might be seen some miles, and heard at a considerable distance; and, as the shoalest part is not more than a cable's length inside, and no danger near it, a vessel might avoid it.

"To the eastward of the last-mentioned shoal, in latitude 41° 51′ N., and longitude 67° 26′ W., is another small shoal, with 8 fathoms water, having, however, considerable breakers. There are but 17 fathoms for 3 miles to the northward of it, but very near to the eastward are 31 fathoms, and from 20 to 30 fathoms to the south and west.

"The centre of the east shoal is in latitude 41° 47′ N., and longitude 67° 19′ W. It is about two miles long from east to west, and has 7 fathoms water. To the southward there are but 17 fathoms for two miles, but in other directions there are from 20 to 30 fathoms.

"The above shoals, I am confident, are all which are on St. George's bank; their positions and sizes may be relied on, as well as the soundings which I have laid down. They were ascertained by a vast number of celestial observations, taken with good and well-adjusted instruments, on board the two vessels, and very carefully and faithfully calculated. The rates of the chronometer were found by a transit instrument, previously to sailing from Boston, and after our return, and all our observations recalculated for the small variation that appeared.

"At anchor in different places, and on different days, we determined the set and strength of the tides, and, as nearly as possible, their rise and fall. The rise of them is from one to one and a half fathom. They set round the compass every tide, setting S. E. every full moon, and running from one to four knots per hour, at a mile's distance from the breakers. The mean rate is, however, materially varied by the winds. They set strongest at W. S. W. and E. N. E., and which is, undoubtedly, the strength of the flood and ebb. From these causes, and variety in the tides, arises a principal danger in approaching the shoals. When under way about the shoals, in a few hours' time, we found ourselves drifted far out of our reckonings; and to ascertain our situations, when both vessels were under way, we took continued observations for the longitude of the chronometers, and at the same time double altitudes for the latitudes; which latter were calculated by Broscius's new and certain method. By allowing for the set of tides, as ascertained at anchor, the observations and reckonings agreed very nearly, so that the latitudes and longitudes of every place may be considered as certain. Should, therefore, any vessel fall in with these shoals, a knowledge of the course and strength of the tides will prove of the greatest importance, and they can, by the preceding facts, be calculated for any day and hour.

"In proceeding from Cape Cod to the shoals, at 5 leagues from the light, there are 86 fathoms, muddy bottom. The water gradually deepens to 133 fathoms, and then decreases towards the shoals. In latitude 41° 51′ N., and longitude 68° 11′ W., there are 90 fathoms; in latitude 41° 50′, and longitude 68° 3′, there are 49 fathoms, sand and gravel, on the western edge of the bank; the water then shoalens fast. To the northward of the shoal, in latitude 41° 59′ N., and longitude 67° 52′ W., on the south side of the north channel, there are 60 fathoms, soft mud; in latitude 42° 12′ N., and longitude 67° 51′ W., there are 102 fathoms; in latitude 42° 10′ N., and longitude 67° 18′ W., there is no ground at 175 fathoms. To the eastward we did not ascertain the extent of the bank. Two miles southward of the S. E. point of the shoals, there are from 20 to 26 fathoms, which soundings continue 20 miles to the southward and westward.

The bottom on the bank, so far as we examined it, is of such a narrow character, that it is difficult for a vessel to ascertain her situation by it: we often found a great variety of soundings in a very short distance, such as sands of various colours, stones, sponge, and shells. Notwithstanding this variety, some general character of the soundings may be useful. The mariner, therefore, will find, to the westward of the shoals, and at some distance from them, the bottom to be coarse sand and gravel, of all colours; to the N. W., a mixture of white, black, and yellow sand; to the north, black and white sand; to the N. E., chiefly gravel and pebbles; to the east, fine white and yellow sand; and in latitude 41° 57′ N., and longitude 66° 40′ W., some white moss; to the S. E., fine white and yellow sand.

"As the shoals are approached, in whatever direction, the soundings become coarse, and are frequently mixed with shells of different kinds. Near the shoal, much of the bottom is pebbles; and to the east of the largest and most dangerous shoal, there are stones the size of hens' eggs, with moss and sponge on some of them.

"Near the S. E. point is from 15 to 20 fathoms; a prevailing character of the soundings is green shells, chiefly of the species called sea eggs. If a vessel be far enough south to avoid danger, she will have no shells.

"The reports that rocks have been discovered on these shoals are undoubtedly incorrect. At the western part of the bank we saw, in strong tide-rips, large quantities of kelp and sea weeds, which, at a distance, had the appearance of rocks, but, on sounding, we found good water, and a regular and clear bottom.

"It will be seen by the bottom, that the holding ground is not good; but the vessels employed in the survey, by having a long scope of cable, frequently rode out a considerable gale of wind, for 22 hours, on the east side of the main shoal, and also to the windward of it, the sea breaking very high at the time, we being in ten fathoms' water.

"It may be worthy of remark, that at one cast of the lead, on examining the arm-ring, I found one-third black sand, one-third white sand, and one-third green shells, in as distinct dimensions as they could be drawn."

16. BRETON'S ROCK. This shoal was seen by Breton, a pilot, of Rochelle; and again was seen in 1816, by the ship Tiger, on her passage from Barbadoes to Liverpool. It is thus described by a passenger:—"On the 14th of March, at 10, *a. m.* a smart breeze from S. W., with studding-sails set, going 7½ knots an hour, steering E. by N. *true*, in lat. 39° 40′ N., and long. 41° 40′ W., we passed over a very agitated rumbling sea. Under our starboard bow, in appearance about a circle of a mile, was a small field

of dark brown rock-weed, apparently a confirmed fixture; entangled with the weed were two pieces of spar, seemingly very much decayed. I am positive that this is a danger which ought to be carefully avoided by all ships coming to Europe from the West Indies and America, as it lies directly in the track."

17. HUME'S REEF. This danger was first made known by Mr. Alexander Munn, of the brig Joseph Hume, on a voyage from Mobile to Liverpool, the purport of whose communication is as follows:—On the 22nd of August, 1827, they discovered a sand-bank, in latitude 39° N., and longitude 64° 20′ W.; they passed close to, saw the white sand above the water, and sounded where the vessel then was, and found 20 fathoms, sandy bottom, a quarter of a mile off. The mate requested of the master permission to go for a few buckets of sand, but he would not grant it. The bank was observed from the mast-head to be of a horse-shoe form; the opening of the shoe facing the S. W., and appeared in length to be not more than half, or three-quarters of a mile. Mr. Munn further stated, that they were obliged to bear up and sail to the westward of it, in deep water, and supposed it to be on the eastern edge of the Gulf Stream. The longitude here given cannot be supposed to be altogether correct, as it was not determined by chronometer or lunar observation, but was calculated back from the day on which they sounded on the eastern edge of the Great Bank of Newfoundland.

18. PRINCESS ELIZABETH SHOAL. Extract of a Letter from Lieut. Scott, commanding the Princess Elizabeth Packet:—"On the 24th of April, 1828, at three o'clock, P. M., I came on deck, and immediately observed the water round the ship very green, and with every appearance of being in soundings; and, on looking before the starboard beam, saw under water, at the distance of about two cables, what evidently appeared, to the master and myself, to be a white sand-bank or rock, which the water did not then break on, but it appeared so very plain, that there could not be much water on it. In extent it was about one, or one and a half cable, E. by N., and W. by S. (true bearings), and about half a cable in breadth. Immediately on observing the shoal, I ordered the lead and line up, but, ere it was ready, the colour of the water had changed to a deep sea-blue, when it was evidently no use to sound: at that time we were about a mile from the white spot; we had at the time a good breeze, but very little swell of the sea, for the Atlantic Ocean. I obtained two sets of lunar distances the day before; and at noon, on the 23rd, had taken myself, with a sextant, the meridian altitude *very particularly*, in order to obtain the time correctly for lunar distances, on the opposite side to those taken on the 23rd; and which I did obtain, and made the latitude of the shoal 38° 16′ N., and by the mean of the lunars, which differed very little, in longitude 39° 48′ 49″ W. Owing to a defect in my chronometer, I was not enabled to bring forward the longitude by it, but every care and attention in my power has been taken to give its correct situation."—*Nautical Magazine*, 1832, *page* 12.

19. ROCKS NEAR THE AZORES. *Copied from the Nautical Magazine for* 1840, *page* 881. "J. Manvel Marriano Ferreira, pilot, while navigating from Paraiba to Lisbon, on board the Brazilian brig Constante, as master and chief pilot thereof, and being to the westward of the Azores, near the parallel, and not very distant from the meridian of some sunken rocks, marked in the chart as doubtful,—at 10 A. M., on the 26th of August, 1840, sailing in a northerly direction, with light winds from the E. S. E., saw breakers to windward, at the distance of one to two miles. Shortly after, it fell calm, and my vessel remained in the same position for six hours,

and in sight of the said breakers, so that I got the boats out, to keep her head away and tow her out of danger. At noon, it being then high water at that place, the surf had nearly disappeared; at 2 P. M., it again became perceptible; and at 6 P. M., a group of rocks was clearly visible above the water. By the latitude I had observed at noon, and the longitude given by a good chronometer, and the rocks being about a mile and a half distant from me, I compute their situation to be in north latitude 37° 56′ 20″, and west longitude 33° 4′ 8″, from Greenwich. As the wind freshened, at 6 P. M. I made sail again, and having arrived in three days in sight of the island of Flores, I found that my chronometer was perfectly correct. The wind being east, I tacked to the southward; and, on the 31st of August, I passed near another sunken rock, which is marked in the chart as having been seen by Capt. Robson, to the westward of Fayal. At 8 A. M. I saw some rocks above water, over which the sea broke, and which I passed to leeward, at the distance of one to two miles. By observation, and the chronometer, I calculate this second danger to be situated in north latitude 38° 26′ 44″, and longitude west of Greenwich 30° 25′ 10″, all which I certify without any doubt.—*Lisbon*, *6th October*, 1840."

20. TULLOCH ROCKS. Captain Henderson, of the Fortescue, from Mauritius to London, gives the following particulars of these rocks:—"On the 17th of April, 1829, being in the exact parallel of the Tulloch rocks, then in sight of the islands of St. Michael and St. Mary, the wind fair and weather clear, I shaped a direct course for them, in order to convince myself of their existence. At noon, observed the latitude by meridian altitude 37° 27′ N., at the same time, the man who was placed at the fore-topmast head, looking out, gave notice of seeing breakers ahead. I stood on till I saw them myself, when I observed breakers in one bearing from the ship W. S. W., the former about 4 leagues, the latter nearly two miles: there appeared to be several heads near the surface of the water. The wind being westerly, and heavy ground swell, (having a fair wind), was the only cause of my not sounding. The mean longitude that day, by moon and star Antares, and a well regulated chronometer, proved at St. Helena and Ascension, was 24° 3′ W., amplitude, *p. m.* 24° 10′ W., heavy swell, and the compass very unsteady."

In the Nautical Magazine for 1832, *page* 170, *is the following*:—"We have before us the copy of a letter of Captain Henderson, commanding the ship Fortescue, who states, that he saw the Tulloch rocks on the 17th of April, 1829, in about the same position as before reported, but, unfortunately, he did not try for soundings. On the application of the Trinity-house, H. M. S. Ariadne, commanded by Captain F. Marryat, was sent in search of these rocks, in the summer of the same year; but, after taking her departure from the Formigas, and steering a course which would have carried her upon them, had they *existed* in their reported situation, nothing was seen of them. The boats of the Ariadne were also sent in search of them, in charge of the proper officers, and although the weather was fine, and every thing favourable to their discovery, they could not be found. We are, therefore, compelled to let the Tulloch rocks remain on the list of reported *vigias;* and the recent loss of the Zillah in that neighbourhood, stated in our Miscellany, is a sufficient caution to navigators to beware of undiscovered dangers near the Formigas."

21. DŒDALUS ROCK. The existence of this rock was confirmed on the 6th of March, 1839, by Mr. John Aves, commander of the Tantivy, of Plymouth. At 9 *h.* 30 *m. p. m.*, this vessel, on her voyage from Zante, passed close to the eastward of it; it was not seen till close aboard, and not avoided without difficulty. There was a swell from the N. W. break-

ing over it, and a sheet of foam, about 20 to 25 fathoms in circumference. The Tantivy stood in N. N. E. on the starboard tack, till 7 next morning, then tacked to the southward, passing the cape at the distance of about two miles. The rock was thus estimated to lie considerably to the eastward of its position as shown by the chart, and to bear about S. S. W. *true*, 37 or 40 miles from the cape.

22. THE EIGHT STONES. *Extract from the Nautical Magazine for* 1837, *page* 456. "According to M. D. Apres, these rocks were discovered by Captain Vobonne, of London, in 1732; and by a vessel of Bordeaux, going to the West Indies, Captain Vobonne counted eight rocks even with the surface of the water. He placed the southernmost of them in 34° 30′, and the northernmost in 34° 45′ N. latitude; he gives them 3 leagues in extent from east to west, and adds, that the southernmost rock is 40 leagues N., 5° E., *true*, from the east end of Madeira. M. Fleurien, having considered that Captain Vobonne must have ascertained the latitude of this danger, either by an actual observation when in sight of it, or else by dead-reckoning, calculating his distance run from it to the east point of Madeira, concludes, that in the latter case, if the east point of Madeira were not laid down upon the charts, *then*, existing as it is *now*, the position ascribed to this danger by Captain Vobonne, must partake of the error. Now, the English and Dutch charts, of that time, lay down the east end of Madeira in 32° 30′ N. lat. only; and in an old English chart this danger is laid down agreeably to Captain Vobonne's description, and on that chart the east end of Madeira is placed in 32° 30′ In our chart, the reef appears extending from 34° 40′ N. to 34° 50′ N., in longitude 16° 35′ W. If, however, Captain Vobonne determined its latitude by *observation*, then its position, as given by him, will be correct. We have adopted the idea, that Captain Vobonne ascertained its position by *dead-reckoning*, and have therefore placed on the chart, according to the corrected latitude and longitude, and of course rather more to the northward than Captain Vobonne, although nearer to Madeira than he stated it to be.

"Messrs. Verdun, Borda, and Pingré, observe, how surprising it is that a danger of such large extent should not have been discovered before the year 1732, and that it should not have been often seen since, so much frequented as these latitudes are. It is, however, inserted on the chart, without pretending to vouch for its existence. In 1826, it was vaguely reported at Madeira, that the Eight Stones had been lately seen."

Such is the account of the Eight Stones, and it would appear that the vague report alluded to, of the shoal having been seen in 1826, may have originated in the following circumstance, which we find mentioned in the remarks of Lieut. W. P. Croke, commanding the Emulous Packet, in 1828:—

"The boatswain's mate, of H. M. P. Emulous, under my command, William Ward, who is a steady good man, and worthy of credit, states that when serving in the merchant-ship Nautilus, of London, commanded by a Mr. George Hall, a Lieutenant, R. N., they fell in with a shoal, as he thinks, about 30 leagues to the N. W. of Porto Santo; that a boat was lowered, and he, the said William Ward, went with Mr. Hall, and plainly perceived breakers, weeds, and the rocks; that the weather was fine, and that he heard his commander and the mate say, that 'these rocks must be the Eight Stones.' W. Ward does not know the latitude or longitude, but says that both were well known to Mr. Hall, and that chronometers and lunar observations were constantly used."

Lieut. Croke also adds, "I beg further to state, that during the last voyage, on the 28th January, 1828, I passed over the spot where the Eight Stones are laid down in the Admiralty charts, and consequently they do not exist *there*. It was a fine day, and I had three good chronometers, which, on making Porto Santo, the next day, perfectly agreed."

The remarks of Captain Beechy, published in his account, of the Blossom's voyage to Bhering Strait, and we may add those of the other officers generally, are so much to the same effect, that we may save the reader a repetition of them. But we may be permitted to observe, in conclusion, that, though the existence of these rocks appears more than doubtful, yet that it would be unwise and unsafe to expunge them from the chart, till all the neighbouring sea has been ploughed by careful navigators.

23. ASHTON ROCK. Captain Guy, of the ship William Ashton, discovered this danger, on the 22nd May, 1824. "About 12 o'clock, the man at the wheel saw something on the starboard bow, distant about one mile, which shortly proved to be a rock, having hauled the ship towards it, and passed to the westward of it, about two cables' length. It was about 8 feet above water, and its base appeared about 100 yards in circumference, on which the sea broke. By a good observation, the latitude was 33° 48′ 50″ N., longitude, inferred from lunars the day before, 71° 41′ 20″ W.

24. HARCOURT ROCK. North of Bahamas. *Copied from the Nautical Magazine for March*, 1834, *page* 129. The following statement of this reported danger is made by Captain C. Huntley, of the ship Governor Harcourt. As we do not find that soundings were obtained near it, nor even tried for, we must be content for the present in laying the account of it before our readers, to place it on the list of doubtful dangers.

"I sailed from Belize, on the 17th of November, (1833,) and on the 30th of November, about 8h. 40m. a. m., saw something on the lee-bow, and at about 9 came abreast of it. I, with the rest of the officers and passengers, saw distinctly that it was a coral rock. We were about 60 yards to the southward of it, I immediately hove the ship to, and lowered down the quarter-boat. Unfortunately the boat swamped, and with some difficulty, I got the chief mate and boat's crew on board again. I got some very good sights for an excellent chronometer, and by a very good observation at noon, and by reducing the ship's run, I find that this rock lies in lat. 30° 49′ 15″ N., and long. 78° 27′ 30″ W. from Greenwich. It was about 8 feet above the water, and in the fall of the sea it branched out to the N. N. W., about 30 feet distance."

25. GANDARIA REEF. EXTRACTS FROM THE GACETA DE MADRID, MAY 28TH, 1842. "The pilot, and second captain of the Spanish merchant ship Dolores Ugarte, (matriculated at Havana,) from Guayaquil, made the following declaration on oath, at the residence of the captain of the port of Corunna. That on Monday, the 18th of April, (1842,) 107 days from Guayaquil, they saw from the deck of that vessel, a group of rocks, about a cable's length in extent, and in the middle of them a large one, high and insulated, on which the sea broke violently. The latitude at the time, they were seen was 25° 29′ 55″ N., and longitude 31° 0′ 30″ W. The latitude observed at noon was 25° 40′ 45″ N., and longitude also, 31° 12′ 2′, W. from Cadiz, at the prudent distance, which the vessel was from the rocks at the time, being that of four miles.

FROM THE GACETA DE MADRID, OF 1ST OF AUGUST, 1842. In the Gazette of the 28th of May last, notice was given from this office of a new vigia, named the Gandaria Rocks, being placed on the chart, and to which was assigned an uncertain position for want of more certain information. Having since received more exact accounts, this office, in compliance with its promise, proceeds to inform seamen, that the said may be considered as existing in the position assigned to it, the observations for latitude being excellent, and also those for longitude with the chronometer. Consequently it has been inserted in our charts without the notice "doubtful," which had previously accompanied it.

With reference to this danger, it may be also added that, in the archives of this office, is a statement of Capt. Don J. P. Garcia, dated Corunna, in the year 1790, in which, among the notices he had obtained, he gives the position of certain dangers, and among them one, which he places in lat. 25° 20′ N., and long. 31° 22′ 27″ W. of Cadiz, which may be the same rock as that discovered by Gandaria, as the small difference of situation might very well arise from the instruments used in that day. As the above document contains no authority, nor states whether the position of it is obtained from estimation or observation, nor any reference by which its existence might be removed from doubt, it was not inserted in the charts with the view of not increasing the vigias on them. Now it becomes the duty of this office to publish every thing which may tend to shew its undoubted position.

26. MARIA AND BONETTA ROCKS, &c. &c. Extracts from a letter, addressed to the Secretary of the United States' Navy, by Lieutenant Commandant Charles Wilkes, commanding the South Sea surveying and exploring expedition, and dated on board the sloop Vincennes, at Rio Janeiro, November 27th, 1838. "The first reported shoal was the MARIA ROCK, in latitude 19° 45′ N., and longitude 20° 50′ W., which we stood for, and hove-to near the position, until we had ascertained our situation correctly by careful observations. The vessels were then spread, and the course marked, to run directly over the spot. The surface of the ocean, visible at the time from the squadron, was not less than 60 miles in circumference, with every opportunity which the clear weather could afford, and sufficient swell of the season to have caused breakers on any shoal within 15 feet of the surface. Nothing, however, was discovered, and no bottom could be found with 300 fathoms of line. The next position examined was BOM FELIX SHOAL, said to be within 30 miles of the Maria rock; this we searched for in the same manner, but were equally unsuccessful. We then stood for the place assigned to the BONETTA SHOAL, to the eastward of Bonavista, said to be in latitude 16° 32′ N., and longitude 20° 37′ W. We in like manner hunted for this, and after exploring the locality of its position on the chart, I steered on the course of its reported bearing, E. by N. from Bonavista, until nearly up with the HARTWELL REEF, lying in sight of Bonavista, which has, without doubt, been taken for, and reported as, the shoal called Bonetta. Our enquiries at St. Jago assured me, that the Madeline (the vessel last wrecked) was cast away on the Hartwell reef, which has been reported as the Bonetta shoal.

"I am well satisfied that the positions assigned to the above three shoals, on the chart and their vicinity, are free from all dangers. I am of opinion, also, that the particular and indefatigable search made by Captain Bartholomew, of H. M. S. Leven, and the opportunities afforded me of covering, with the squadron of five vessels, so large a space, at the same time, ought to be sufficient evidence that no such dangers *exist*, as they are laid down in those positions, and should cause them to be obliterated from the charts.

"From Port Praya we steered for PATTY'S OVERFALLS, as laid down in the chart, in latitude 11° N., and longitude 24° 30′ W., and had a good opportunity of examining their locality. A few rips were observed within a degree of the situation assigned them, but little or no current was found; and I feel confident in asserting that no danger exists in this vicinity, as we were becalmed in the position, and in close proximity to it for 48 hours, the squadron as usual being spread apart, and having a broad expanse of ocean under view. Owing to contrary winds, it was some days before we reached WARLEY'S SHOAL, said to be in latitude 5° 4′ N., and longitude 21° 25′ W. This point was also carefully examined, but no shoal, or appearance of shoal water, or any danger, discovered.

"Our next examination was of a FRENCH SHOAL, said to be (as laid down) in latitude 4° 5′ N., and longitude 20° 35′ W This was also examined, and no danger or appearance of shoal discovered. From this point I took advantage of the southerly wind, and proceeded east, which carried me as far as 13° of west longitude, and over the position assigned to the shoal by the French hydrographers, to enable me to cross the equator eastward of the 17th degree of west longitude. We succeeded in crossing the equator in that longitude on the 5th of November, and then stood off the Triton's bank, said to be in latitude 0° 32′ south, and longitude 17° 46′ west. When within a short distance of its position, the squadron hove-to, for the purpose of ascertaining our position accurately; after which, a course was steered nearly west. Being at the time well to the eastward, we ran on a line due east and west over it, the vessels of the squadron being spread about three miles apart, on a line north and south. We did not, however, find it in our progress, or any bottom, or indication of soundings; no discolouration of water was visible, or change of temperature, although the line extended 30 miles east and west of its reported position; after which, we again stood to the north, and ran over a *vigia*, as laid down on the charts, but none such was found in existence. Our next examination was for BOUVET'S SANDY ISLAND, which was, in like manner, carefully searched after, in and around its position, as laid down in the charts, but our search was equally unsuccessful."

"Finally, search was made in and about latitude 2° 43′ S., and longitude 20° 35′ W. Extending to the N. N. W. of this point a distance of 30 miles, hereabout having been assigned as the situation of the sub-marine volcano, reported by Admiral Krusenstern, which it was supposed might have left a shoal. This locality was twice run over in different directions, and carefully examined, with the squadron in open order, but none such was found in existence."

"Lieutenant Hudson, of the *Peacock*, having separated from me on the 16th of October, proceeded on a different course, in search of the same shoals which we were looking for, but was equally unsuccessful in finding any, as appears by the following extract from his report to me, which affords further evidence, if it were needed, of their non-existence.

"'Having separated from you on the 16th of October, it was not until the 23rd that I had worked up to the WARLEY'S SHOAL; and, at 8 o'clock that night, was directly on the spot where it was laid down on the chart. We placed good look-outs, and kept our patent lead going, for 50 miles, before reaching the location of this shoal, as laid down on the chart; also, observing our drift at night, in hope of sweeping over it at early day-light. I continued cruising in this vicinity in various directions, getting casts of lead in from 50 to 100 fathoms, without finding bottom. I now continued my examination, and after having swept over a circle of 40 or 50 miles, in different directions, am perfectly satisfied that Warley's shoal exists nowhere in the neighbourhood laid down on the chart.

"'I then proceeded for the FRENCH SHOAL, the wind ahead, (S. by W.) where I arrived on the 25th of October, and continued cruising all the following day, with a fine breeze, immediately over the location of the shoal as laid down, and in every direction, for miles in its vicinity. After thus thoroughly searching the English locality of this shoal, I directed my course for the French position, 76 miles distant, making nearly an east course, with look-outs and the lead going, until I had run immediately over and around the spot, sailing in various directions a distance of 40 miles, without effect.

"'I then made the best of my way for the TRITON BANK, with the wind veering and hauling from S. S. W. to S. S. E., and passed the equator, on the night of the 3rd of November, in longitude 17° 40′ W., and continued over and around the locality of that bank, until the morning of the 5th, getting casts of the lead during the time, in from 50 to 250 fathoms, up and down, without finding bottom. I have, in our search, fully satisfied myself, and hope our examination will prove equally so to you and all others that these shoals do not exist.'"

27. DELAWARE SHOAL. Captain Ross, in the brigantine Delaware, from Charleston, on the 16th September, 1839, at noon, in latitude 10° 38′ N., struck soundings in 37 fathoms, shells and sandy bottom. At 3 *p. m.* steering south, passed over a rocky bank, having 5, 7, and 10 fathoms, and bottom plainly seen: inferred from the distance run that the latitude of the shallow part of the bank must lie in 10° 37′ N., longitude, by chronometer, 60° 3′ W.; at 3¼ *p. m.* had 70 fathoms water.

28. ST. PAUL, OR ST. PENEDO DE ST. PEDRO, is a cluster of five steep craggy rocks, without verdure, covered with birds' dung, and with no place fit for anchoring, or convenient for landing. This small island has been seen by Indiamen, both outward and homeward bound, although it is considerably to the westward of the common course of the latter; and no ship bound to the southward should cross the equator so far west. Its appearance is that of a heap of rugged rocks with gaps between them, and a modern navigator has said a vessel may be aground upon them in the night, unless the surf beating up against them should be loud enough to apprise him of his danger, for close to them are 30 and 40 fathoms water. This islet, or properly speaking islets, may be seen at the distance of 3 or 4 leagues, and always makes like three sail when first seen. The current, hereabouts, sets N. W. by N. *(true)* one mile an hour.

SECTION IV.

THE COAST OF AFRICA.

TANGIER BAY affords convenient anchorage in 8 to 10 fathoms, but caution is required to avoid a rocky shoal on the eastern side, bearing S. E. by E. ¼ E. from Tangier point, and S. W. by W. ½ W. from Cape Malabat; the latter cape in a line with Europa point. Gibraltar leads clear of it, so that it will be proper to anchor with Gibraltar open of the cape. Moor to the N. W. and S. E. with the longest cable to the N. W. Implicit obedience should here be observed to the advice given by the consul, in your intercourse with the natives. About three-quarters of a mile distant, N. by W. ½ W., from Cape Malabat is the *Almirante*, a rock of 3 fathoms; and there is also a sunken rock about the same distance from Tangier point, which lies with the inner coast of Tangier S. by W. (S. by E.)

CAPE SPARTEL, the N. W. point of the state of Morocco, is so high as to be seen, in clear weather, at the distance of 14 or 15 leagues, appearing like an island. The outer point, when seen from a short distance westward, appears uneven, with eminences on it like hummocks, and the high lands resemble the awning of a galley. The ground about the cape is quite clear, with the exception of some high rocks, steep-to. At the distance of two miles from shore are 98 fathoms, the bank immediately dropping to an unfathomable depth. To the southward of the cape, the bank extends much further off, and there is excellent anchorage on a bottom of mud and sand, with shelter from easterly winds.

Hydrographical Notice. H. M. S. Dido, March, 1838. "From Cape Spartel, the direction of the coast is S. W. for 20 miles to Arzilla, a small fortified town, situated close to the shore, between which and Cape Spartel there is good anchorage all along the shore, with an easterly wind. The depths of water are regular, as you will have from 10 to 15 fathoms, from 1 to 2 miles off shore, on a sandy bottom: the coast line is a flat sandy and shingly beach, rising to a fine grazing country in the interior. The Road of Jeremia, the usual anchorage near Cape Spartel, extends from it 8 or 10 miles to the S. W. We anchored in the following positions near Arzilla, in smooth water, and well sheltered from a strong Levanter:—1st anchorage,—Cape Spartel, N. E. ½ N.; town of Arzilla, S. by W. ¾ W.; extremity of land to the right, two points nearly in a line, S. W. by S.; in 15 fathoms, sand and small shells. From this anchorage to the nearest shore was about 1½ mile; soundings very regular to a depth of 5 fathoms, which was two cables' length from the shore. 2nd anchorage,—Cape Spartel, N. E. ¾ N.; centre of town Arzilla, S. ¼ E.; two bold and prominent points to the S. W. of the town, nearly in a line, S. S. W. ½ W.; in 13 fathoms, coral rock, gravel, and sand."

"Nearly midway between Cape Spartel and Arzilla is the village of *Almadrones*, near which landing can be effected. One of our boats, sounding in this vicinity, landed, and on two officers and two seamen, part of the boat's crew, walking not more than a hundred yards from the beach, in hopes of procuring stock, (numerous heads of cattle grazing in the vicinity) they were immediately seized by a party of Moors; three were detained and conveyed into the country, the fourth person having effected his escape. The ship, then lying at her first anchorage, was soon under way and run down off Arzilla, demanding from the governor the officer and men detained. A party of Moorish horsemen were now sent to scour the country, who found them on their road to Tangier under a guard: on this they were escorted back to Arzilla, but were refused to be delivered up until permission was granted by the governor of Tangier. The delays were so protracted that we anchored (to make a serious demonstration) off the town, in 4½ fathoms water, at about 600 yards distant from the shore, and 150 yards outside a reef of rocks, a wash, which describe a semicircle without the beach line, (affording good shelter under its lee) the principal fortress bearing S. ½ W. The next day we received our people, by permission of the authorities of Tangier, and started from their inhospitable shore.

"To account for the foregoing proceedings, it appears, by a treaty, that trading is forbidden at any port on the Moorish coast, at which there is not a British consul, or his agent. At Arzilla there is a Spanish Jew, in the latter capacity, who behaved uncommonly well on this occasion. Now as we landed only 5 miles from an authorised port, it appears they carried this article of the treaty to its fullest extent. In fact it is generally attended with fatal consequences for a Frank to land on an unauthorised part, on any pretence, whether from distress, or a want of knowledge of their customs. As a proof of the general ignorance of this custom, we had on board, at the time of the above incident, five merchant captains, who had been in the habit of trading to the S. W. ports of Morocco, who knew not that landing was against their laws; and it is only to be regretted that our consuls, in Morocco, should not give more general information on so serious a point. Four or five miles to the N. E. of Arzilla is a small river, called the Wad el Ayasha; it is barred across the entrance, but flows sufficiently strong for a good supply of water, and the distance to roll the casks (the boat being anchored clear of the surf) not above 50 yards."

From Arzilla the coast trends S. W. ½ W., and is easily distinguished by a remarkable white patch which is seen nearly 15 miles off; but the best mark for the coast is the *Peak of Fas*, an insulated mountain resembling a sugar-loaf, which stands S. by E. ½ E. (S. E. 5° E.) from off the entrance of El Araiche. The town of EL ARAICHE stands on the river Al Khos, and will be known, when approaching it, by a large castle and batteries. The best anchorage is with the town between the South and S. S. E. The mouth of the river, which appears very broad, is really very narrow at low water, and has then only 5 and 6 feet water over it, but there is a rise and fall of 9 to 12 feet. Inside, the water deepens to 24 feet. A pap or rising spot, on the north side of the river, is 200 feet high above the sea. The best anchorage in the roads, for vessels intending to enter the river, is with the distant conical mountain Fas, appearing in the centre of the entrance, one mile from the point, in 12 fathoms, sand. Supplies are abundant, and there is a fine spring of water on the northern shore, very convenient for shipping.

Between Arzilla and El Araiche, the ground is tolerably clean, but not very good, being coarse gravel, with 25 and 30 fathoms of water, at from one to three miles from shore. Before El Araiche the depth decreases, and there are only 4 fathoms at two cables' length from shore. In sailing along this coast, you must not advance too near, unless it be with a strong easterly wind, for often, in calm weather, there is a heavy swell from the West or N. W., which may render it difficult to get off shore.

The *Peak of Fas*, above-mentioned, serves as a mark for the old town of *Mamora*, from which it bears nearly *true* east. The site of Old Mamora, known by several white-washed tombs, the chief of which is that of Muley Bu Selham, at the outlet of a stream, said to flow from a small lake, 20 miles to the southward of El Araiche. At two cables' length from the bar is a depth of 5 fathoms, gradually increasing to 34 fathoms, at two miles from shore. The coast between El Araiche and this spot is straight, and for the most part upwards of 250 feet in height; reddish cliffs for the first 10 miles, then sand-hills, partly covered with brushwood. There are everywhere from 20 to 25 fathoms of water, at half a league from shore, and you may anchor off the coast hence to Slaa, or Salee. Ships sometimes anchor here, during a calm, to avoid being drifted by the currents, which set to the southward, along the coast; and the velocity of which, especially at the full and change of the moon, is frequently from one to two miles an hour.

From hence, the coast extends 10 leagues, S. S. W., to Mehedia. The coast is very clear, and readily known, being of white sand, as far as about the middle of its declivity, while the upper part appears like cliffs. The river Sebou, on the south bank of which the town is situated, is impassable, except in boats, or on rafts, at some distance from the sea, although navigable near the ocean. Here vessels may anchor half a league from shore, in 12 or 14 fathoms, sandy ground, with the town bearing from S. E. by E. to S. E. by S. All along this coast the swell is sometimes excessive on the shore, which, with the S. W. winds, render it very dangerous.

Between Mehedia and Slaa, or Salee, the coast is rather low, and may readily be known by its white sandy strand. About half-way, the strand rises, and thence, southward, the shore consists of black and steep rugged rocks, with small hills. Salee, with the town of Rabat, is situated on the river Bu Regreb; the latter is rendered remarkable by the high tower of Beni Hassan, which may be discerned, in fine weather, 20 miles off. It is built of hewn stone, is 180 feet in height, 35 or 36 feet broad. At a small distance to the northward of it, are the ruins of an ancient wall, on which were formerly a battery and castle. There is a bar across the river, rendering it only navigable for small vessels; but there is a good anchorage between the mosque and the tower, for ships of every burthen, which, however, can only be considered safe from March to the latter end of August. Many anchors have here been lost, so that attention must be paid to the cables.

The small peninsula of Fedala, sometimes mistaken for an island, affords indifferent shelter to small vessels during westerly winds. A roadstead here is supposed to be the only one, with the exception of Agadeer, in the parallel of 30° 27′, wherein ships on the coast may ride in security during winter. This is owing to a projection of the land, south of the peninsula above-mentioned. Between Rabat and Point Fidallah, there is no danger beyond a quarter of a mile from shore; the bank of soundings extends to the distance of 20 or 22 miles from the land, increasing south-westward. About one league from the shore, there is a depth of 20 to 30 fathoms, rocky ground; it then becomes sandy, increasing to 60 and 100 fathoms. At 4 leagues W. by S. from Fidallah, is Dar-el-Beida, a small walled town on the beach, within a point projecting half a mile N. N. E., *true*, and forming a cove, three-quarters of a mile deep, and well sheltered from westerly winds. This place is easily known by its towers, one of which seems almost as high as Hassan's tower, at Salee. The coast between is low, and bordered with small islets, all very near the land. A reef of rocks lie at one-third of a mile off the town, and the landing-place is behind them. Some other parts of the bottom are likewise rocky, and in winter the anchorage is unsafe, owing to the current, &c. From the cape, rocks extend to the distance of nearly half a mile; and further off, is a rocky bank of 6 fathoms. At 20 miles to the west, is a depth of 150 fathoms, dark sand, decreasing rapidly, toward the land, to 45 fathoms, at 12 miles from shore, and then gradually to the beach.

About 13 leagues to the south-westward of Dar-el-Beida, is the small town of Azamar, standing on the river Morbeya, but it affords no safe anchorage: three leagues further, are the remains of Mazagan. This place is on a low rocky point, projecting to the north, which forms the western limit of a sandy cove, of about a mile and a half, and affording a good roadstead for small vessels. It is defended by several redoubts, enjoys a little commerce, excellent water, and good supplies. There is anchorage off the coast, at one league from the shore, in 15 fathoms, clear sandy ground; but at the west point of Mazagan, is a ledge of rocks, which stretch to the N. E. (N. N. E.) about a league into the sea, and are uncovered at low water. The shore hence to Cape Blanco (north) is rocky and dangerous to some extent, and ships that stop here must anchor at two leagues off, in 35 or 36 fathoms of water, oozy ground; the swell is almost always very great, and the currents very strong. From Mazagan to Cape Blanco, the distance is 4 leagues; midway, are the ruins of Tett, an ancient town, and a conspicuous tower, 128 feet high, and 148 feet above the sea, which may therefore be seen from a great distance. Two large tombs, kept whitewashed, stand on either side of it. The coast hereabout should not be approached nearer than a mile and a half, as scattered rocks lie off the shore, and the bottom is very uneven. The beach, in some places sandy, is generally lined with craggy rocks. A line of barren hills, 200 feet high, slope to the beach along the whole distance, and terminate just to the northward of the cape, in a low and dark, but abrupt and rocky cliff.

CAPE BLANCO, NORTH, is somewhat remarkable, by its white and red spots, and looks like a wall at a distance; safe anchorage may be found on the S. W. side. At 22 miles westward of Cape Blanco, are soundings of 150 fathoms, fine sand, gradually decreasing to 28 fathoms, at 4 miles from the shore. The coast, 6 miles south of Cape Blanco, is 465 feet high. Twenty-one miles S. W. of Cape Blanco, stands the mosque of Edor, on the summit of the land, which is about the highest between Tett and Cape Cantin.

CAPE CANTIN. Ten miles S. W. of Edor, is Cape Cantin, an abrupt cliffy point, about 211 feet high, prominent and remarkable, when seen from the N. E. or S. W. It has a building very close to the point. Between this cape and Edor, the coast is in many places skirted by small rocky islets, on one of which stands apparently a small fortress. Four miles S. W. by W. of Cape Cantin is a gravel bank, on which are 25 fathoms; and 16 miles westward from the cape, are soundings of 100 fathoms, fine sand: this depth gradually decreases eastward. From Cape Cantin to the north point of ASFEE, or SAFFI BAY, the coast trends S. S. W. (nearly south) 4 leagues, and is much higher than the coast already described. Between these points, at the distance of a league from shore, is a rocky bank, extending North and South, *true*, having over it from 30 to 40 fathoms, and at times abounding with fish. From the north point of the bay (which is foul) to the town of Asfee, or Saffi, the distance to the S. S. E. is 2½ leagues.

Between Cape Cantin and the bay of Saffi, the coast is one continued white cliff, with a sandy beach at its base; the cliff, rising gradually to its southern projection, is then 530 feet in height, and here the bay commences. In the bight within is a ravine; and on the slope stands the ancient town of Saffi, surrounded by a wall 31 feet high, with a ditch, and defended by 24 heavy guns next the sea. Fresh water is scarce, and procured from wells southward of the town. Although the road is safe in summer, yet in winter, when it blows from the S. or S. W., it cannot be considered so, being much exposed to those quarters.

If bound to Saffi from the northward, shape such a course as will lead sufficiently to the westward of Cape Cantin, in order to avoid the rocks about that cape. You may easily know on which side of Saffi you are standing, as the land to the northward of the bay is high and uneven, and that to the southward of it is a plain even land. During the summer months, or from March to October, the bay affords as good anchorage and smoother water than any other on the coast, but is entirely exposed to westerly winds; the bottom is of sand and mud, and there is generally a depth of about 15 fathoms, at a mile from shore. Vessels may anchor at a league from the town, in 20 or 22 fathoms of water, gray and oozy sand. To anchor in the road, the north point, on which stands a low tower, must be brought a little to the northward of N. N. E.; or, further in the bay, the same point may be brought North, (by compass) a little easterly, when the northernmost of two northern points will appear about a ship's length, open, without the southernmost, and the high castle of the town S. E. by E. or S. E.; the depths 16 to 18 fathoms, fine gray sand. There is also anchorage within, in 15 fathoms, with the north point N. N. W., or N. by W.; but these are the summer roads. In the winter, you must anchor further from the land, in 20 or 22 fathoms, as above-mentioned. You may boldly run in to the summer roads by night, with the castle bearing E. by

S., or East. From the south point of Saffi bay, which is very low, to the mouth of the Wad Tansift, or River of Morocco, the coast trends S. S. W. $\frac{3}{4}$ W. (S. $\frac{3}{4}$ W.) 16 miles, and presents generally a line of sand-hills, from 150 to 200 feet high, which, in some places, terminate in low cliffs, and in others, slope to the beach. There is a large tank on shore, nearly midway between Saffi and the Tansift; and on the southern bank of the river, is an old castellated building, square and roofless. The bar of the Tansift, although a considerable river, is in summer entirely dry at low water.

MOGODORE is the principal sea-port of the kingdom of Morocco, distant from Asfee about 20 leagues S. W. The coast between, is fair, clear, and moderately high. Mr. F. J. Evans, acting master of H. M. S. Dido, says, "It is but little frequented, and that by the smaller description of vessels. The exports, which consist principally of gum, wax, wool, and skins, are chiefly in the hands of the English and Americans. As a harbour, it merits but little praise, although the best on this coast. The harbour, or, as it is generally termed, the bay, is formed by two small bends of the coast, like a horse-shoe, protected from the sea of the Atlantic by the small rocky island of Mogodore, situated just without the converge of the two bends. The town of MOGODORE is built on the sea coast, and northern edge of the bay. It is well defended by nature, being completely surrounded, on its sea face, by an abrupt collection of detached rocks, on which the sea generally breaks heavily, barely admitting a landing under their lee, except in very favourable weather. Its artificial defences are apparently rapidly on the decay, but it still boasts its castles and batteries, with guns mounted, and placed certainly in favourable points for defence. It would be, perhaps, difficult to estimate the number of inhabitants, but it would appear to be about 10,000, one-third of whom are Jews. The annual number of trading vessels are about 40, few exceeding 200 tons.

"The island of MOGODORE, which lies about half a mile to the S. W. of the town, is a black, barren, and uncultivated rock, about 80 feet above the level of the sea. It lies N. E. by N., and S. W. by S., (true) half a mile in length, and one-quarter of a mile in breadth, with several detached rocks on its northern, western, and southern sides: the anchorage is under its eastern shores. It is fortified and garrisoned by a small party of Moors from the town, and being used as a place of confinement for state prisoners, landing or communicating is not allowed, unless with the permission of the governor of Mogodore.

"The entrance to the bay from the northward, is between the rocky islets lying off the north end of the island, and those stretching to the southward of the town; a clear channel, of about 2 cables in width, with from 7 to 9 fathoms water. The general depths, in the centre of the bay, vary from 4 to 5 fathoms, rocky bottom, with a superficial covering of sand. The actual clear space in the central part of the bay becomes very much contracted, (a quarter of a mile being the fullest space) from the flats of shoal water running off the main shore, the rocky shoals off the town, and a bar of 12 feet, at low springs, stretching from the S. E. part of the island, to the converge of the two days before-mentioned.

"The usual anchorage is immediately under the central part of the island, at half a cable's length from its shores, in about 15 feet, low water, loose sandy bottom. A central position in the bay is directly open to the swell of the Atlantic, which occasionally sets in, even in moderate weather, with great violence, and vessels close under the island feel its influence, with the wind from any direction,—an instance of which will be given.

The bay, to the southward of the island, (that is between it and Cape Sem) cannot be called an anchorage, and is only used as a point of egress, with the wind from the N. E., which blows directly into the northern bay; its depths of water agree very nearly with its northern neighbour.

"To a stranger, there can be but little difficulty in getting to an anchorage in the harbour, with the prevalent or N. E. wind, taking the channel to the northward of the island, steering midway between the rocks, and ranging along the island's eastern shore, dropping anchor within half or a whole cable of it, rather towards its S. E. point, mooring with a small scope of cable, with open hawse, either to the northward or southward, according to the prevalent winds or season of the year. On leaving the anchorage, you will generally have to take the southern passage, running over the bar which connects the island with the main, having, in mid-channel at low water, springs 12 feet. The following mark, for running over the bar, was communicated to me by the captain of a merchant vessel, who had used it:—The great mosque of the town, which is near the beach, on with the centre of a house having an angular roof (being the only one of that nature in the town) carries you out in mid-channel over the bar, in 12 feet at low water springs, running out into the southern bay, until you bring an old fort, on the sea beach abreast of the island, on with a small mosque, similarly situated a little to the N. E. of it,—which mark will carry you clear out to seaward. It is necessary to observe, that the sandy bottom of the bay is extremely loose, and at times collects, as I proved, in creeping for anchors which had not been lost six weeks, and were completely buried; the harbour, notwithstanding, is not filling up, no doubt from the great under-run, after a gale.

"A considerable loss of merchant vessels took place here, in a heavy gale of wind from the S. W., in the latter end of January, 1838. They were four in number, varying in tonnage from 110 to 250 tons, lying under the island, in the berth before-mentioned, riding with three anchors ahead. The dangers of their position did not arise so much from the violence of the gale, as from the tremendous back-run of the sea, round the northern entrance of the bay, being in direct opposition to the wind. The harbour, even to the depth of 5 fathoms, was a complete mass of breakers, and greatly discoloured, from the quantities of sand washed from the shores; the whole presenting a scene, as described by the sufferers, difficult to be imagined. The consequence was, stern boats and windows were dashed in, and deck cleared; three, out of the four, drove from their anchors on the sandy beach, close to the town; and the fourth, after being thrown several times nearly on her beam-ends, from the conflicting powers of the wind on the bow, and sea on the quarter, was obliged, in the height of the gale, to slip and run on shore. Fortunately, from being driven so high on the beach, no lives were lost; but they were seriously plundered by the Moors, chiefly from the inland districts, which in a measure (by the reports of the individuals) was connived at by the governor of Mogodore, although protected by his guards.

"From the foregoing observations, it will be imprudent for vessels of a large tonnage, and a draught of water exceeding 15 feet, (unless in fine summer weather) to anchor in the harbour To vessels of a larger nature, and paying a short visit, fair anchorage can be obtained outside the island; but this is open to the westward, from S. W. round to N. E. by E., and at all times there is a swell setting in from seaward. In H. M. S. Dido, we anchored in 13¼ fathoms, fine sand of a dark colour, and found the anchor had very good hold, on weighing, after remaining two and a half days, and riding part of the time with a fresh breeze and much swell.

"Bearings of Anchorage:—r x.* land to northward, N. E. by E.; castles of Mogodore (the governor's residence) S. E. by E.; r x. rocks off castles, S. E. $\frac{1}{4}$ E.; l x. rock off island, S. by E. $\frac{3}{4}$ E.; r x. ditto, S. W. by S.; r x. land to southward, off Cape Sem, S. W. This anchorage was three-quarters of a mile off the castles. We had been informed, on anchoring, by the pilot, who came off with the British consul, that this was the best outer anchorage, but that the ground was loose. The rise and fall of tide in the bay varies in height; it generally averages from 8 to 10 feet, but occasionally has been known from 12 to 14; it is also generally regular in its ebb and flow, although its direction varies with the wind, and other local causes. This question I have asked of several traders, but they are not aware of any particular direction. No doubt the flow rushes in direct from the westward, or body of the Atlantic. High water at full and change is about 4 h. 30 m. *p. m.*

The Currents along the coast inshore, it is said, will be found occasionally setting to the northward, but well out in the offing, to the southward. I am induced to agree with this statement, especially the latter, having for several days found a slight set to the S. W. of a quarter of a mile per hour: it is no doubt greatly influenced by the winds, in velocity and direction. The winds along this coast generally blow from the N. E. quarter,—nine months is estimated as the average time; it has consequently received here the name of the regular trade-wind: with this wind, the atmosphere is clear, and appearance fine; winds from the southward are productive of rain and cloudy weather. The stormy months are in December, January, and February.

"On making Mogodore from seaward, the land to the northward is rugged and high, some 15 or 20 miles, having observed it at a distance of 10 leagues. This was the range of iron mountains, (the highest peak, 2350 feet—average height of range, 2100 feet.) On a nearer approach, as the coast line rises, (which is barren and sandy, the tops of the sand-hills being alone covered with verdure) it has a misty appearance near the horizon. The town can be readily distinguished at a distance of 3 or 4 leagues, the mosque towers and castles showing out plain; as also the island, which, being a black rock, shows out boldly against the ranges of sand-hills forming the sea coast,—there being no similar feature on the coast for many leagues.

"There is only one landing-place in the harbour, which is at the foot of the castles, and called the 'Water Port,' being under a bridge connecting a rocky group of islands (on which are fortifications) with the main; its passages are intricate and difficult to be described. In moderate weather, it is tolerably easy to pull through the breakers, but in a gale, impracticable. A stranger, in pulling in, will always be guided by the bystanders on the rocks, and at the Water Port; once performed, it is easily remembered. A mark for the north-eastern passage, or one nearest the rocks, is the gate of the Water Port, kept directly open.

"Water can only be procured in very small quantities; the town is supplied by an aqueduct from the fresh water river running into the sea abreast of the island. It is generally impracticable to land on the beach in its vicinity, and permission must be obtained for this. All supplies must therefore be obtained at the Water Port, and they are brought there by donkeys, at the rate of 2d. for ten gallons. The temperature of the climate ranges between 70° and 50° during the year. Stock is not plentiful,

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r x. and l x.—right and left extremes of land.

nor in good condition, and prices not very moderate at this season of the year." *Nautical Magazine for* 1839, *page* 373.

From Mogodore to Cape Geer, the course is S. W. by W., by which you will avoid the rocks that border Cape Tefelneh. The land about Cape Geer (distant 6 leagues from the Cape Tefelneh) is very remarkable by a high round hummock in the interior, visible at a distance of 12 miles. A reef extends from the north side of the cape, some distance, so that it is advisable not to approach in less than 20 fathoms water. About 9 leagues from Cape Geer is the Cleveland reef, (the position of which will be found in Table 2, page 89) having only 3 or 4 feet water on it.

AGADIER, OR SANTA CRUZ, stands about 6 leagues S. E. of Cape Geer, at the bottom of an extensive bay, where there is an excellent well-sheltered anchorage for vessels of all burthens; but the commercial character of this place having ceased, it is in consequence but little frequented. The high land, extending from Cape Geer to Agadier, usually called the heights of Idantenau, is the western extremity of the main chain of the Atlas, which ranges hence in an E. N. E. direction, and rises at 9 miles to the eastward of Agadier, to the height of 4,500 feet, and a remarkable conical hill, nearly 4,000 feet.

At 6 or 7 miles to the N. W. of Agadier, above a point stretching into the bay, is a good anchoring place, with from 20 to 12 fathoms. In sailing from the cape to the road, be sure to run along by the land of the cape till you are before the castle, because northerly winds are very prevalent here; and should you keep too far from shore you may be forced to fetch it up again with difficulty. If coming in by night, approach no nearer than in 12 or 14 fathoms. *To anchor in the road of Agadier*, bring the castle to bear N. N. E., and the storehouses E. N. E. Here you will be to the southward of a rocky ledge, lying off the town, in 7 or 8 fathoms of water. The best riding is with Cape Geer bearing north, in 6 or 7 fathoms. Care must be taken to have your anchors ready; your small bower is always to be laid out before the land-wind, and the others to seaward; the sheet-anchor must also be in readiness, and brought out to the S. W. against a storm, which is soon perceived by the rising and swelling of the sea. It is likewise necessary to keep the foresail to the yard, that you may defend yourself the better, should you happen to be driven from your anchors.

At 5 miles to the southward of Agadier is the mouth of the Suse, a fine river, rising at the base of the Atlas; but the bar is dry at low water, and can never be passed by vessels drawing more than 4 or 5 feet. The Wad Messa, about 30 miles from the Suse, has likewise a bar, dry at low water, but may have 4 or 5 feet over it at high water, spring tides.

At a few miles to the northward of the Messa are the Tomie, or Seven Wells, off which is an open roadstead. From the Messa, southward, the beach still continues sandy, but verdant hills, approaching the sea, break off into cliffs, apparently of sand-stone, about 100 feet in height. In the interior is a ridge of high mountains, at 50 or 60 miles from the coast. The interval between appears like a wooded and well-cultivated country, with many houses and farm-buildings. Immediately to the southward of the cape is a little sandy bay, and a valley crossed by a hill, on which stands the village of Aguluh: a small stream runs down the valley. At 12 miles to the southward of Aguluh, the features of the country change; the hills become barren and abrupt, and form in successive ridges, gradually increasing in height, till they join the line of mountains, which rise to the height of nearly 4,000 feet, and appear to be the S. W. extremity of an off-set of the Atlas. More to the southward, the appearance of the inland country continues the same, but the coast changes to dark red cliffs, broken into coves, on the beaches of which boats may be seen.

In latitude 29° 22′ N. is a remarkable white cliff, which forms a good mark for the coast; behind it, and standing alone, is a conical shaped mountain, rising to the height of 3,900 feet; at 25 miles from shore are soundings in 105 fathoms, broken shells; outside of this the bank drops very suddenly. On standing inshore the soundings decrease rapidly to 60 fathoms. At 5 miles from shore are 28 fathoms, coarse sand; the depth thence decreases very gradually to the beach. From the cliff, above described, the country assumes a more rugged and barren appearance; the hills steep, with deep and narrow ravines; the coast, alternate cliffs and sandy bays, with prominences rocky and rugged. In latitude 29° 10′ N. is the Regula, or Gueder cove; a rocky cliff on each side projects to a short distance, the sides are steep and barren; these are separated by a deep and narrow ravine, down which a slender stream finds its way to the sea. In this cove the water is deep, and bottom clean to the beach; a landing may generally be effected in it, but it affords no shelter. In latitude 29° 3′ N. the mountainous country terminates, and a sandy desert commences. There is also a break in the coast, called the Rio de Playa Blanca, or White Beach river; at 4 miles to the southward of this the coast is of bold sand-stone cliffs, with sand downs in the interior devoid of herbage, and thus it continues to Cape Non.

Cape Non is a cliff of sand-stone, 170 feet above the sea; it is steep-to and clear of danger. Here the depth gradually increases outward, and at the distance of 4 miles from shore the depths are from 30 to 34 fathoms, bottom of reddish sand; at 12 miles, 57 fathoms, dark sand; and at 30 miles, 98 fathoms, coarse red sand; the water then deepens very suddenly. For a long distance, both to the northward and southward of the cape, as well as to seaward, the water is very much discoloured; it has a red tinge, and is so thick that the track of a ship is visible for a length of time. At 4 miles to the S. W. of Cape Non is the river Shleema, and at 31 miles more is the Akassa. Each river has a bar, but both appear to have deep water inside, and the banks of both are verdant and fringed with shrubs. The Shleema, when well open, may be recognised by two remarkable hills, which will then appear in the centre of the gap; they are conical, and on one of them, 325 feet high, are some ruins, said to be those of a fortress. The coast between Cape Non and the Shleema affords secure anchorage, with moderate depth of water, from the month of March to October.

From the river Akassa the coast and country continues as described above. The cliffs are about 120 feet in height to the Porto Causado, a fine sandy bay, having 9 or 10 feet within a cable's length of the shore. The distance across is about 3 miles: the two outer points are broad, closing to within one mile; a ledge of rocks on each point, leaving a fair entrance of half a mile in breadth, with deep water; against these ledges the sea breaks violently, but in the harbour it is smooth. From the windward side of the harbour a ship might lie very well, with the wind at N. E. Its only distinguishing mark is a table hill, 580 feet high above the sea. Nothing can be conceived more dismal than the appearance of the shore hereabout. For many miles not a dark spot is to be seen to break the monotonous appearance of the sand; the fine particles of which mingling with the haze, occasioned by the heavy surf, render the coast very indistinct.

At a short distance to the westward of Porto Causado a cliff, from 90 to 100 feet in height, again commences and continues for 17 miles. This cliff is of dark sand-stone, and the bottom, being also of dark sand, gives a green appearance to the water. A flat desert extends inland as far as the eye can reach. There is no beach, the sea breaking against the cliffs, on which it appears to be encroaching. Where the cliffs terminate the land becomes broken into sand-hills, partly covered with bushes, and the coast trends in a *true* direction 80° W. to Cape Juby, 15 or 16 miles.

CAPE JUBY is a low sandy point; near its extremity is a hummock covered with bushes, appearing like an islet. Rocks extend from the cape to one-third of a mile. Here the coast changes abruptly to S. W. (*true*), and form some coves, off the points of which are scattered rocks. From Cape Non to Cape Juby, the bank of soundings extends to an equal distance, and the depth decreases very gradually to the shore.

CURRENTS. From Cape Spartel, along the coast, to Arzilla, and also to the distance of 7 or 8 miles from the shore, a regular tide was experienced, running parallel to the coast; but its strength was rather greater to the northward than to the southward. In this distance, at 15 miles from land, no tide or current was perceptible. From Arzilla, southerly, a tide was still experienced, gradually diminishing in strength, till its direction could not be ascertained. From the parallel of 34° 30′ N. to the distance of 20 miles in the offing, a steady southerly set was first experienced. This current, in the offing, continues invariably to follow the direction of the land; its velocity increasing or diminishing from the rate of four-tenths to one mile an hour, according to the strength or continuance of the north-easterly winds.

From Mogodore to Cape Boiador the current continues invariably to run in the direction of the coast. Its greatest strength is usually at the distance of from 3 to 6 miles from the land, gradually decreasing on receding from it. Its average rate, between $31\frac{1}{2}°$ to 28° N., is from one-half to three-quarters of a mile in the hour. At Cape Juby, probably from its stream being in some measure confined by the projecting cape, and perhaps by the Canary islands, (distant 58 miles) it increases its rate to one mile and a quarter, but diminishes off Cape Boiador to one mile. It did not appear that this current was influenced by any particular wind, but near shore a tide was generally perceived.

CAPE BOIADOR has some rocks about it, but on its south side there is anchorage in 4 or 5 fathoms, or further out, about a league distant, in 18 to 20 fathoms. There is no road of any consequence in all the intermediate coast, between this cape and Vera Cruz. It is for the most part desert, inhabited by various tribes of Arabs, who make captives of all who happen to fall into their hands. Along this dangerous coast are numerous rocks, even, or nearly so, with the surface of the water, over which the sea breaks violently; the current also sets with great rapidity towards the shore, so that we regret to state, that vessels are but too often wrecked and endangered, by getting driven too near the land, for the want of due calculation in this respect, which is so highly essential on this deceitful coast.

From Cape Boiador, the coast trends S. W. ½ W. (S. 20° W.) about 21 leagues, to a very remarkable cliff, about 300 feet high, called the *Penha Grande*. As its height considerably exceeds that of any spot in its vicinity, it may serve as a good land-mark. It is flat and arid; all its declivities are precipices, from broken earth which has fallen down, the colour of which is gray. The whole of this coast is perfectly clean, even to the beach. From the Penha Grande, the coast trends S. S. W. ¼ W. (S. 6° W.) 8 leagues, and includes a slender bay, called *Garnet bay*. It then forms a well-defined elbow, and trends nearly S. W. by W. ¾ W. (S. W.) 29 leagues. The whole of this beach is continually washed by an exceedingly heavy surf, and there is no sign of vegetation on the whole coast.

Garnet Bay, or *Angra dos Ruivos*, abounds with cod, bream, hake, and various kinds of other fish. There is good anchorage in it, to the northward, with fine sandy bottom. Two leagues to the southward of Garnet bay, are seven small table hills, called the Seven Capes, which constitute an excellent land-mark. From hence to the Rio Ouro, or Gold River, the distance is 18 leagues: here there is good fishing and fresh water, but the river itself is shallow and dangerous. No particular current was observed off the Rio Ouro, which consequently does away with the supposition of a river emptying itself by this opening. From the southern point of the Rio Ouro, the coast trends nearly S. W. (S. S. W.) The cliff continues to a distance of 5 leagues, when white sandy downs succeed, of which the summits are mostly flat. At 1 league northward, (N. N. W.) from the extremity of the cliffs, and at 3 miles from the coast, there is a bank, having only 32 feet of water; its direction is parallel to that of the coast, and it is about 2 miles in length. Thirteen fathoms have been found on the edge of this bank: to the northward of it, the bottom is sand and shells; to the southward, fine sand; and on the bank itself, broken shells.

Cintra Bay is distant about 4 leagues from the Rio Ouro, and is distinguished by a peaked sand-hill, of remarkable appearance. The bay is shallow on the north, by a low projecting point, having a reef extending from its southern extremity, distant from the south side of the bay, which is also encumbered with a reef, about 6 miles; there is also a rock, nearly in mid-channel, over which the sea breaks in tempestuous weather. About a mile within the entrance is a depth of 47 fathoms, sandy bottom; but between the mid-channel rocks and the reefs, on either side, are 9 and 10 fathoms. From Cintra bay the coast trends S. S. W. ½ W. (S. 10° W.) to a distance of 7 leagues; the shore at first is low, but it gradually rises, and becomes a continued down of white sand. In the interior are 4 or 5 sand-hills, called the *Downs of Cintra*, which serve as a mark for the coast, and may be seen 4 or 5 leagues. The Bay of St. Cyprian is formed by Cape Barbas on the west side, and a high cliff, having a flat top resembling a fortification, forms the east point. The bay is open from N. E. to W. N. W., and affords but little security from the prevailing winds.

From Cape Barbas the coast trends nearly W. S. W. (S. W.) 3 leagues. It is formed almost by one uninterrupted cliff, about 80 feet high, at the foot of which the sea breaks violently. At one mile from the beach there are from 9 to 12 fathoms; and at two miles, as much as 17 fathoms, with a bottom of muddy sand, or sand and broken shells. The coast then declines into white sandy downs, studded here and there with cliffs. At 3 leagues from this it forms rather a remarkable little bay, with shore of white sand. The mouth of this bay is barred, at about 3 miles from its bottom, by a flat of banks and reefs, on which there is very little water. These reefs form an islet, called *Pedra da Gall*, and another small islet, called *Virginia*. The first, which is rather higher on the northern than on the southern side, is about half a mile in circumference; the latter, or southern one, is three times that size, and has some sandy patches. At one mile westward from these islets may be found 18 fathoms of water, with muddy sand. The depth increases to the southward, and the bottom becomes harder. From Pedra da Gall to Cape Blanco the distance is 29½ leagues. The coast in this extent is nearly straight, and moderately high; it is one continued down, the whiteness of which becomes more vivid on approaching to the southward.

Cape Blanco is a high white cape, of remarkable appearance. There is a bay formed by it and another point, 4 miles to the northward, having a beach of white sand interspersed with masses of the white cliffs, through one of which the sea has perforated a hole in the shape of an arch. In this bay, as well as anywhere along the coast, as far as Cape Corveiro, there is good anchorage in 10 to 12 fathoms. There is a bay on the east side of the promontory, named Greyhound bay, in which, as well as within 10 miles round Cape Blanco, the currents are subjected to regular tides, the flood setting E. N. E., and the ebb the contrary, its greatest velocity running 1 to 2 miles an hour.

Captain Belcher says, "The tides about Cape Blanco are irregular, and much influenced by the land near which they run. High water, at full and change, may be looked for about noon ; the greatest rise, under every advantage of springs and winds, does not exceed 6 feet. Southward of the parallel of the cape, the indraught has a velocity of 2.6 miles, and the offset or ebb the same. Eastward of the meridian of the cape, the tide bends northerly ; and at three miles chord, its velocity appears from S. W. to N. E. about 2½, following the circular course into Greyhound bay. North of the parallel of the cape, the ebb sets north, and flood south ; and, close in shore, the tide is considerably weaker than at 3 miles, where its greatest influence may be expected."

THE BANK OF ARGUIN. Twelve miles S. by W. from Cape Blanco, is the formidable bank of Arguin, extending as far south as Cape Myrick, where it is met by another small bank, and between which there is a passage nearly 5 miles wide, with 4 fathoms, leading into the bay and river St. John. This bank is dangerous, and ought carefully to be avoided by vessels making Cape Blanco, bound to the southward. On its north end there is a ledge of rocks, forming the entrance to Greyhound bay, on the east side. On the western end of the bank are only 3 fathoms, whereas close outside are 20 fathoms ; in coasting along, therefore, it will be prudent not to approach nearer than 30 to 35 fathoms, as far as Cape Myrick.

CAPE MYRICK is a low sandy point, on which there is a small down, and should not be approached nearer than 2 or 3 leagues. The coast to the southward of the cape is low, and represents a chain of small regular downs of white sand, interspersed with small bushes, forming an indent of the coast named Tanit bay. The coast then trends to the S., to some remarkable downs, called the Angel hillocks, which serve as a good land-mark, being nearly 100 feet high, and will be found of much service in avoiding the Angel bank,—a shoal, extending about one league from the shore, abreast of the northern hillock ; indeed, no part of the coast hereabout ought to be approached at a less distance than 5 miles, nor in less depth than 6 or 7 fathoms.

PORTENDIC is distant about 4 leagues to the southward of the Angel hillocks, on an elevated spot, the beach being distinguished by two palm trees, which served as a good mark for the place, scarcely a vestige of which now remains. From the two palm trees, the coast trends nearly S. S. W. (South) then to S. W. (S. S. W.) It is straight and low, interrupted with small bushes, and presents a continued sameness. In an extent of 35 leagues, there are only two downs of red sand, covered with brushwood, and these are only discernible at about two miles from the beach.

RIVER SENEGAL. **THE RIVER SENEGAL** enters the Atlantic by two embouchures, between 15° 50′ and 16° 30′ N. latitude. It is the largest river in Senegambia, and drains nearly half the surface of that country. The eastern and most mountainous parts of Senegambia, those which lie between latitude 10° and 15° N., and between longitude 7° and 12° W., are traversed by numerous rivers, which, by their union, form the Senegal. The largest of these branches are the *Ba Woolima* and the

Ba Fing. The last-mentioned river is justly considered the principal branch, as it traverses a much greater extent of country than the other rivers before it joins them. It rises, according to the statement of Mollien, in latitude 10° 30′ N., and longitude 10° 45′ W., in the mountain range, which encloses the elevated table-land of Foota Jallon on the south, and divides the waters which fall into the Ba Fing from those which join the Kabba, one of the largest rivers of Sierra Leone. The course of the Ba Fing, to its junction with the Woolima, exceeds 400 miles. The other great branch of the Senegal, the Ba Woolima, rises above 350 miles from the source of the Ba Fing, to the N. E. at the eastern extremity of the mountain range, which separates Senegambia from Soodan, and at no great distance from the banks of the Joliba, or Quorra, near 13° N. latitude, and 6° 40′ W. longitude. Its course is first to the N. W., and then nearly West, at a short distance from the mountains, until it joins the Ba Fing, after having run more than 300 miles. From the south it is joined by the Kokorro, which exceeds 200 miles in length. The union of the Ba Fing with the Ba Woolima takes place near latitude 14° 10′ N., and longitude 10° 30′ W., and from this place the river is called Senegal. About 15 miles below the union of its branches, the Senegal contains a cataract, called the Feloo falls, which, according to the statement of Golberry, is 80 feet high. In this part the river runs N. W., but it soon turns to the West; and, at the distance of about 100 miles below Feloo falls, it is joined from the south by the Ba Faleme, which flows more than 100 miles, and is navigable for a considerable distance from its mouth, during the rainy season.

Between the river and the Atlantic there is a strip of low land, nerely level and covered with sand; it is called the Point of Barbary, and gradually diminishes in width, so that opposite the island and town of St. Louis it is less than 300 yards across. About 5 miles further south, it terminates at the mouth of the river. The tract of land enclosed by the Senegal and Saguerai, consists of many islands, two of which are of considerable extent, and separated from one another, by an arm which branches off from the Saguerai, and joins the Senegal. The northern island is called Bequio, and the southern, Bifeche. These islands are entirely covered with wood, and in the wet season a great portion of them is laid under water. The course of the Senegal, as far as it runs southward, is nearly 40 miles long; but its waters in few places run in one channel, the middle of the river being occupied by a string of islands, some of which are several miles in length, and in some places more than half a mile in width. Even after its junction with the Saguerai, the eastern banks continue to be skirted by islands. The greatest depth of the river is generally found to be west of the islands. Its *currents* are very rapid, and contain a large quantity of sand, which, when brought to the sea, meets the swell of the ocean, and is thrown back towards the land. Thus a bar has been formed across the mouth of the river, on which there is very little water, except at one place, where the currents have forced a passage through the sands: this is called the Pass of the Bar; it is generally about 250 yards wide, and 15 feet deep, but these dimensions are subject to change. Only vessels drawing 12 feet water can pass through this entrance of the river, as the surplus is necessary for the pitching of the vessels, which is produced by the strong swell of the sea. The mouth of the river was formerly two miles further south than it is at present. In 1812, an unusually extensive inundation opened the present mouth, through the narrow sands of the Point of Barbary, and the old mouth was almost entirely filled up with sand.

As a navigable river the Senegal is far inferior to the Gambia; for the Gambia has no such obstacles as its mouth, and the Senegal is much inferior to it in depth, and so full of shoals, that it cannot be navigated by large river barges in the dry season. Gray states that at the end of the dry season it is only 18 inches deep near Bakel, or Baquelle, the farthest of the French settlements. The ascent of the Senegal is only practicable in the wet season, and even then the voyage is slow and tedious, partly on account of the rapidity of the current, and partly because of the numerous windings. It may indeed be ascended to a greater distance than the Gambia, to the foot of the Feloo Falls, which are more than 500 miles from its mouth; but in general it is only navigated to the mouth of the Faleme. The river begins to rise some weeks after the rains have set in, generally in the first week of June; sometimes it attains the height of 40 feet above its lowest level at Bakel, but lower down it does not rise so high. It attains its highest level in the month of August, and begins to fall about the middle of September. In November, or the beginning of December, it again enters its bed. The inundations produced by the rise, appear to be most extensive along the lower part of its course, especially when the islands of Billos and Morfil occur.

Cape Verd. Between the mouth of the Senegal and that of the Gambia, and nearly at equal distances from each, lies Cape Verd, a wide projecting promontory. Its western extremity is a mass of rocks, of moderate elevation and volcanic origin. In its character it greatly resembles the Cape Verd islands, which are nearly 500 miles from it, in the Atlantic Ocean. The northern descent of this isolated mass is rather steep, and at its eastern extremity are two hills, rising about 600 feet above the sea: they are called *manelles*, or paps, and serve as a beacon to mariners. The paps are discernible, in fine weather, at a distance of 25 miles: it is almost unnecessary to warn the mariner not to mistake for them two small hills of a similar form, which lie 12 leagues to the eastward, as the direction of the land is considered sufficient to discriminate. Between the river Senegal and Cape Verd, is the bay of Yoff, which is too deep to afford anchorage, even close to the shore; vessels bound to the southward, should therefore keep well to the westward to avoid the *Almadies Rocks*, off Cape Verd. The sea on the Almadies breaks incessantly. Amongst the rocks are some smooth spots, appearing like channels, fit for boats. The flat may be coasted at the distance of a mile, there being, on the west, 35 fathoms of water; the bottom is of broken shells. Hence, to the northward, in an extent of 3 miles, the depth increases to 80 fathoms; bottom of mud and sand. To the S. E. the depth is not so much; in running along these breakers and the coast, to a distance of two miles in that direction, which will extend to the meridian of the paps, the depth varies from 25 to 30 fathoms; the bottom sand and shells, or sand and rock. The depth continues to decrease to the E. S. E.

About 3 leagues S. S. E. ½ E. (S. E.) from Almadies point, is Cape Manoel, between which are three small islands, called the *Magdalens*, the largest being perforated at its south end sufficiently wide for a boat to pass through. Cape Manoel is high, covered with brush wood, and terminates at the sea side in basaltic cliffs; it forms the western point of the Bay of Goree, Cape Naze forming the other extremity. At the distance of 2100 fathoms from Cape Manoel, E. ¾ N. (N. 65° E.) lies the island Goree, and a vessel intending to anchor must steer for it, and may approach on the south side, within two musket shots. *Goree island* is merely a rock, about 400 fathoms in its greatest length, from N. ½ E. to S. ½ W., (N. by W. to S. by E.) and 167 fathoms in breadth. The southern part, which is about 500 feet above the level of the sea, is the highest, and like a round mountain, may be seen at the distance of 5 or 6 leagues. The rest of the island is very low, and the north point is distinguished only by its batteries and private buildings. The landing-place is on the N. E. side of the island, between the point and the back of the mountain, to the southward, in a small sandy bay.

The Roadstead is to the N. E. of the island. This roadstead, which is sheltered from all winds from S. S. W. to E. N. E., (by the North) is perfectly safe, during eight months of the year; that is, from the first of November to the first of July; but during the rainy season, the squalls from the S. E. are dangerous. The best anchorage for large vessels, in either season, is at the distance of 800 fathoms from the landing-place, with Cape Manoel bearing W. S. W. $\frac{1}{4}$ W. (S. 52° W.) a sail's breadth open of the north point of the island. At this spot there is a bottom of thick clayish mud, with a depth of 12$\frac{1}{2}$ fathoms, and it is convenient to weigh from, with the wind from any quarter. To fetch the anchorage from Cape Verd, in the fine season, when the winds are from N. E. to N. W., it is necessary to run close by Cape Manoel and the south point of Goree, keeping by the wind on the larboard tack, and sounding until in 8 or 10 fathoms. When within a mile of the land, tack and beat up to the anchorage.

The whole coast, from Cape Manoel to Cape Naze, a vessel may run along at a distance of two miles. There is only one bank in this space, the least water on which is 2$\frac{1}{2}$ fathoms. In the neighbourhood of Cape Naze are several Negro villages; the most considerable of these is named Rufisk, having a roadstead, where, in fine weather, you may lie in 6 or 7 fathoms; some rocks, however, lie off this place, but these may be avoided by keeping half a mile from the shore. There are some rocks, westward of Rufisk, stretching about a gun-shot into the sea, which may be avoided by keeping half a mile from the shore. To the West and W. N. W. of Cape Naze is good anchorage, in 4 and 5 fathoms, fine sand; but to the South and S. W. of the cape, the bottom generally is not good. In the night-time, you must proceed in 17 fathoms, having sometimes recourse to the lead; the land, even in the night, will direct you sufficiently to avoid the rocks. In the season of the tornadoes, the road of Rufisk is not good; but in the summer, you may safely lie there in 6 or 7 fathoms, close to the shore, if agreeable.

About 3$\frac{1}{2}$ miles S. E. of the Red cape, which lies to the southward of Rufisk, is Cape Naze; and 4$\frac{1}{2}$ leagues from the latter, is the French factory of Portudal, having a roadstead only fit for small vessels, and that but indifferent. Five leagues from Portudal is Cape Serene, between which, lying in a parallel direction with the coast, distant about two leagues, is the *Amboroo bank*, having but 1$\frac{1}{2}$ fathom on its southern extremity. This danger must be carefully avoided. Its greatest depth is 3 fathoms, with very hard sand. Between it and the land is a channel of 5 or 6 fathoms, and close to its western side is 5 fathoms.

The *River Joal* is about 3 leagues S. by E. $\frac{1}{4}$ E. (E. S. E. $\frac{1}{2}$ E.) from Cape Serene. Here stands a town, of the same name, on the north bank of the river, from which a shoal, having but 2$\frac{1}{2}$ fathoms' water, projects into the sea. The road of Joal is indifferent, and only fit for small vessels; the entrance of the river is 3 miles, having a depth of 3 fathoms in mid-channel. From Palmarin point, the south point of entrance of the river Joal, the coast trends South, (S. by E. $\frac{1}{2}$ E.) 8 leagues, to the Birds' islands,—four small islands which lie on the Red bank, a sand that commences at the river Salum, about 4 leagues from Palmarin point, and stretches along the coast, projecting 4 miles into the sea, and having 4 fathoms' water close to its outer extremity.

RIVER GAMBIA. The Bird islands, with Cape St. Mary, form the entrance to the river Gambia, lying from each other N. by E. and S. by W. 4 leagues. Vessels bound to the river Gambia, on leaving Cape Verd, may run in safely during the night, by not coming nearer than 9 or 10 fathoms; by which precaution, they will avoid the Amboroo bank, the shoals of Joal, the Red bank, &c. In 1819, a flagstaff, with a union jack, was erected on the easternmost Bird island, to denote the pilot's residence for the river. From hence to the town of BATHURST, on the western shore, the distance is 4 leagues. Cape St. Mary is low, appearing like a plain, but rising towards the interior, having a few trees and one house upon it. Between Banyan, or Bathurst point, and Barra point, to the N. E., the river is only 2¼ miles, being the narrowest part of the mouth of the Gambia. From Banyan point projects a dangerous rocky shelf, called St. Mary's shoal, which extends 5 miles N. by W. ¼ W., (N. N. W. ¾ W.,) being even with the water on the ebb. A mile to the N. E. of this is the Middle ground; and three-quarters of a mile to the northward of the latter is the African's knoll. These dangers are separated by deep water of 4 to 6 fathoms, but they must all be left on the starboard side, by keeping towards the eastern shore.

Vessels bound to the river Gambia should endeavour to make the latitude (13° 40′) of Bird island, or 4 or 5 miles to the southward of it; a due east course, until in 5 fathoms, will then bring the flagstaff to bear N. N. E., distant 2 miles, when you may anchor and engage a pilot; or, if desirous of proceeding up, keep the lead going; the bottom on the south side of the channel being hard, while that on the north and east sides consists of soft mud. From the anchorage in 5 fathoms off Bird island, the course to within the African's knoll, off the edge of the Red bank, is S. E. (S. E. by E. ½ E.) 5 miles, and from whence to the anchorage off Bathurst, S. ¼ W. (S. by E. ¼ E.) 7 miles.

When advancing to the Gambia, from the northward, you ought not to approach the river nearer than in 7 or 6 fathoms, before Cape St. Mary comes in sight. It may be adviseable for a stranger not to proceed further than in 5 fathoms without a pilot, unless the vessel draws less than 12 feet of water. Those leaving Goree, when bound to the Gambia, may steer about S. by E., keeping their lead constantly going, and approaching the coast no nearer than in 7 fathoms. When near the entrance of the Gambia, the ground will generally be found an ooz-sand; but, near the cape, sometimes sand and sometimes red shells will be found. The ebb in the river runs very strongly, nearly 8 hours, but the flood is not so strong. Spring-tides are very rapid.

Having approached within one mile of Barra point, from which a small spit stretches off to about a quarter of a mile, keep over for mid-channel, between that point and Banyan, or Bathurst point. You have 8, 9, 10, and 12 fathoms between the two points, and good anchorage in 9 fathoms of water, muddy ground, with Barra point bearing N. E. by N., and Banyan point N. W. The tide of flood sets on Barra point, and the ebb directly on the middle; be therefore very cautious, during calms, on an ebb tide.

From Barra point to Dog island point, on the same side of the river, the bearing and distance are South (S. by E. ½ E.) 8 miles; the coast between forms a deep and shoal bay, and the flats extend from it, into the middle of the river. From Dog island point and reef, the coast takes a sudden turn to the S. E. and E. S. E. and it trends from Dog island point to Lemaine or Lemon point, S. E. ¾ E. (E. S. E. ¼ E.) two leagues. On this shore, at half a league more eastward, is the French settlement at

Albreda, and at half a mile further is the English one, named Jillifree. One mile S. E. from Jillifree, on an islet in the river, is Fort James.

In sailing up to Fort James, which is 17 miles above Bathurst, you steer in mid-channel two leagues, with the town of Bathurst N. ¾ W. (N. N. W. ¼ W.). This leads to a fair offing from Dog Island point. The course hence, in the fairway, to abreast of Lemaine point, is S. E. ½ E. (E. S. E.) 6½ miles; and thence to Fort James E. S. E. ½ E. (East) 3½ miles. In order to avoid the shelf which extends from the Banyan, or western shore, approach no nearer to that shore, in turning, than in 5 fathoms; nor nearer the Barra side, when above Dog Island point, than in 4 fathoms; but if nearer that point, than in 6 fathoms. Lemaine point should have a berth of a mile, as some shoals stretch from it. You may haul in and anchor before Albreda in 4 fathoms, half a mile from it, the ground shoaling gradually to within a cable's length of the shore. After giving Lemaine point a berth, do not haul for the Barra shore till you are abreast of Albreda, for the flat continues to the eastward of that point to a considerable distance.

In 1826, Captain Owen, R. N., made an extensive survey of the river Gambia, from whence it appears that 3 miles above Fort James it is 2½ miles in breadth, it then takes a north-easterly direction, 10 miles to Moota point, on the south shore, leaving a creek, called Jukarda, on the north side, and has a depth, in mid-channel, of 4½, 5, 6, and 7 fathoms. A line of coast, one mile in breadth, and 40 miles in length, terminating at Jukarda creek, was ceded to the British government, by the native chiefs, in 1826, the small settlements of Albreda alone excepted. From Jukarda creek the river pursues an easterly course, alternately shoaling and increasing in depth to a considerable distance. Captain Owen's survey comprehends a distance of 190 miles from the entrance of the river, and exhibits the depths of water as far as Pisanca, where, in the dry season, the tide rises 3 feet: at Pisanca there remains the ruins of a factory.

About 14 miles S. W. by W., from the pitch of the cape of St. Mary, are the Tongui rocks and shoal, which run out about a league from the Bald cape; from thence to Cape Roxo it is 20 leagues, which you may run in safety in the dark, keeping in 6 or 7 fathoms to avoid the bank that extends one league from the shore. There are four rivers before you reach Cape Roxo, the southernmost of which, Casamanza, is the only one accessible, having 2 or 3 fathoms at the entrance, with rocks on each side; the land about the cape is low, with a sandy beach, near which are several tufts of a remarkably red colour. From Cape Roxo the coast trends E. S. E to the river Cacheo, the navigation of which is much impeded by the numerous shoals, called the Cacheo banks, and Falulo breakers; and here commence the various shoals, channels, and islands of the Bissagos Archipelago.

BISSAGOS ARCHIPELAGO. The Jeba Channel is formed on the north side by the main, which is intersected by the several rivers of Cacheo, Jatt, Bassi, and Bissao, thus dividing it into islands, of all which the land is low. Near the S. W. end of Jatt, S. S. E. (S. E. ½ S.) of Cape Roxo, is a small conspicuous island, named *Cayo*, being bold-to, and appearing, on an easterly bearing, like three islands, perceived to be connected by a flat on a nearer approach; it is well wooded, and may, in clear weather, be seen 4 or 5 leagues, consequently serving as a useful land-mark. At 6 leagues more to the eastward (E. S. E.) off the S. E. end of Jatt are several islets, called the *Aneoras*, which distinguish the western side of a river of the same name. The extremity or N. W. part of the Bissagos shoals is composed of hard sand. From this extremity the bank and isles extend to the southward and south-eastward 23 leagues, towards the eastern channel of the Rio Grande; and the flat, which is from 12 to 6 leagues in breadth, is interspersed with banks above and under water, and islands, either dry or marshy, the detail of which is very little known.

Vessels bound for the Jeba, or Bissao channel, and having made Cape Roxo towards the evening, should come to anchor, bringing the cape to bear north. The outer part of the Falulo breakers bears from hence S. by E. (S. S. E. ½ E.) distant 17½ miles, lying to the south-westward of Cacheo river, and extend in an E. S. E. and W. N. W. direction, having 6 to 4 fathoms close to them. Your course, 2 leagues to the westward of Cape Roxo, is S. W. by W. ½ W. (S. W.) for 12 miles, then haul up on the larboard tack, as at this distance the depth increases; afterwards steer S. ½ W. (S. by E.) until you reach the latitude of about 11° 45′ or 11° 47′, in a depth at 6½ fathoms, muddy ground. Here you enter the Jeba channel, and having run E. S. E. ½ E. (East) 12 leagues, you reach the south end of Cayo, the trees on which, as we have stated, may be seen a considerable distance.

The space to the northward of this track is replete with banks, which extend to the main shore, but Falulo are the only ones which break constantly. The depth of water, in the latter course, will be found regular from 7 to 9 fathoms, muddy bottom; it may be further observed that, in entering the great channel, it will be more advisable to keep towards the northern banks than those on the south side, as the latter are close-to, whereas, by a constant use of the lead, you will have due notice of approaching the former.

The Great Channel, on the Meridian of the Islet Cayo, is about 4 leagues in breadth, which is again divided into three channels, by means of two banks of shallow water; the northernmost of these is named the *Bank of Cayo*, having a depth of only 10 feet on it, and lying 4 miles to the southward of the islet of that name: it is rather narrow from north to south, but its length from east to west is about 5 miles. The best of the three channels is to the northward of this bank, in which are from 7 to 9 fathoms. Two miles to the southward of the Cayo bank lies the *Bank of Carasche*, being divided by a depth of 9 fathoms: it lies in a parallel direction with the former, and extends about the same distance, namely, 5 miles in an east and west direction. Carasche bank breaks continually, part of which is dry at low water; it is distant about 4 miles to the northward of an island of the same name, but the channel between is of an irregular depth, and the bottom bad. Carasche island forms the south side of the Great channel.

Having arrived to the eastward of the banks above-mentioned, and intending to proceed for the settlement of Bissao, steer S. E. ¼ S. (S. 60° E.) 5 leagues along the island of Jatt to its S. E. point, having some trees upon it, and appearing somewhat higher than the land thereabout; from hence steer E. S. E. (E. 5° S.) 6 leagues, passing successively the Ancoras islets, the channel between Jatt and Bassi, and the south part of the last island, on one side; while, on the other, you will cross a large bay, formed by the islands Carasche and Cerballe: leave the Parroquet islands on your starboard hand, and finally reach within a league of the west side of Bissao island. From the S. W. end of the latter to Bonn (hereafter described) the course is E. ¼ N. (E. 20° N.) running parallel with the island of Bissao, and passing several shoal patches of 4 and 4½ fathoms.

Bonn, or Bourbon, is an islet to the southward of the town of Bissao; two miles above it is another, called *King's isles*, and 7 miles from it, on the south side of the river, is *Arcas*, an island on the eastern side of the channel to Rio Grande, and is the distinguishing mark for it.

In proceeding towards Bonn, St. Martin's point of Bissao, 3½ miles W. ½ S. (W. S. W.) from the former, must be avoided, by giving it a berth of a mile and a half; being within 3 miles of Bonn, bring it to bear N. N. E. ½ E. and steer directly towards it, passing about 200 fathoms to the eastward: from hence proceed between King's island and the fort, keeping nearer the latter, and anchor in 6 to 8 fathoms, soft muddy bottom. The ROAD OF BISSAO lies in the principal stream of the river Jeba, between the eastern side of the island and King's island opposite, and is perfectly safe and well sheltered. The fort stands 100 fathoms from the beach, about 300 paces to the southward of which is the watering place; the water, though reckoned wholesome, is not agreeable to the taste, and, previous to its being drank, should be acidulated, or purified by red-hot shot.

The WINDS in the Great channel of the Bissagos nearly follow the direction of the land, and vary their course according to that of the channel. In the Great channel they vary from west to north; at the anchorage of Bissao they commonly blow from the S. W., except in the morning, when they are from the northward. In the rainy season, which commences in June and continues about 5 months, they blow from the S. E., with the tornados, the same as on the coast, and then, passing round by the south, return to the northward.

ANCHORAGE. A vessel may anchor anywhere in the Great channel, the bottom being of soft mud and excellent holding ground, with the exception of one place at 2½ miles to the southward of the isle Jatt; here the depth is from 20 to 22 fathoms, and the bottom of coarse gravel. In all other parts of the channel the depth varies from 13 to 6 fathoms, without any sudden alteration.

TIDES. The usual prevailing currents on the coast, to the northward of Cape Roxo, are found to be completely changed on passing this cape. They have here no longer one only direction; and, in all the channels of the Bissagos, are superseded by tides, which are more or less regular. Those in the Jeba, or Great channel are perfectly so. Westward of the isle Cayo the flood sets S. E., and the ebb N. W., each six hours, or nearly so, with the exception that the current gradually assumes these directions, requiring nearly an hour from the change, before it is completely settled in its course. The flood generally sets to the northward, and the ebb to the southward. The greatest difference which has been observed between the high and low water marks is 8 feet; and, at the equinoctial full moon, the rate of the flood and ebb is about one mile and two-fifths an hour; at other times it never exceeds one mile. At the entrance of the Great channel, which is 6 leagues to the westward, and on the parallel of the island of Cayo it is high water, at full and change, at 9 *h.* 15 *m.*

From the meridian of Cayo, and as far as that of the isle of Bonn, the stream follows the direction of the channel; and here the tides are regular. It is not known that the length of the ebb exceeds that of the flood. The greatest rate of either never exceeds 2½ miles per hour, in spring tides; and the rise is found to be 8 feet, as outside the channel. On the meridian of Cayo it is high water, at full and change, at 11 *h.* Before Bissao the rate of the highest tides never exceeds 2.6 miles per hour; and the mean rise is 7½ feet. It is high water, at full and change, at the anchorage of Bissao, at 12 *h.* 30 *m.*

Besides the Senegal and Gambia, which are the largest rivers of Senegambia, the country south of the Gambia is drained by two rivers, which are navigated to a considerable distance from their mouth; these are the Rio Grande and the Nunez, or Kakoondee.

The Rio Grande is stated to originate on the western declivity of a range of mountains, the waters from the eastern slope of which form the most remote branch of the Gambia, near 10° N. lat., and 11° W. long. As far as its course lies, within the mountain region, it is joined by numerous tributaries, among which, however, the Coomba only is a considerable stream, and its course is rapid. Before it leaves the mountain region it is said to form a cataract, near 13° 20′ W. long., and from this point downwards the river is navigable for river-boats. At a distance, exceeding 100 miles from the sea, the river divides into several branches. That branch which continues to flow in a western direction is commonly called, on our maps, Rio Grande, but the native name is Butolah. Small vessels may ascend it as far as Bolola, a short distance below the bifurcation. Its mouth is opposite to Bulama island, which belongs to the group of the Bissagos, or Bijooga islands. That arm which runs northward, from the point where the bifurcation takes place, is called Jeba river. Having continued in that direction about 50 miles it turns westward, and divides again at the Portugese settlement of the same name. This branch is navigable, for small vessels, from Jeba to the sea, and for large vessels from a point about 5 miles above Bissao. The most northern arm, which is called the Cacheo river, is navigable, for vessels drawing not more than 10 feet water, to the settlements of Cacheo; and for smaller ones much farther. As the country between these arms is exceedingly low, and its soil mostly consists of alluvium, which is inundated for some months in the year, there is said to be a great number of minor channels, by which the principal branches of the rivers are united.

The Eastern Channel, or that of Rio Grande, branches into the Jeba channel, to the westward of Arcas island; its west side is formed by a flat extending to the eastward of the Parroquet and Galinha islands, and the bank which joins these to the Hog islands and that of Kanyabac; its eastern bank is formed by the islands of Arcas and Bulama, with the banks that connect them. Being intersected by the mouth of the Rio Grande, it again commences at Bossessame, and forms a chain of reefs as far as the island Yombere: the channel is here divided into two branches by a bank, 4 leagues in extent from north to south, on which are several islets and breakers, with Cavalho and Honey islands, and Pullam, which lies to the southward of the latter. The western or main channel is bounded, on the west side, by part of Orango island, and chain of reefs running S. S. W. from it.

Large vessels proceeding for the channel of Rio Grande, from the northward, must observe that a bar shelters the S. W. part of Arcas isle, terminating at the distance of 4 miles, by a rocky bank, forming part of the bar, over which are only 3 fathoms at low water. In order that this may be avoided, bring the island to bear E. ½ N., (E. N. E.) and steer so as to keep the western point of Bulama island South, (S. 17° E.) until you reach within two miles of it; from hence, if you intend going to the southward, keep towards the middle of the strait, formed by Bulama and Galinha islands. Vessels bound to the northward, and having brought Arcas E. ½ N., should steer N. by E. ½ E. (North) until she has passed the parallel in which it lies. The west end of *Bulama*, or *Boolam*, may be approached within a mile; the course from hence is S. by E. ¾ E. (S. 36° E.) 3½ leagues, crossing the mouth of the Rio Grande, which separates Bulama from Bossessame, and keeping at the distance of a mile from the half-tide banks to the S. E. of Galinha. The depths in this track vary from 30 to 10 and 8 fathoms; bottom chiefly of sand and gravel.

Bulama is well wooded and of moderate height; it has some well-sheltered roadsteads, affording safe anchorage; that on the S. W. side of the island has a depth of 20 fathoms, and although the tide rises 12 to 15 feet, the sea is generally smooth, and the landing easy. Here fresh water may be procured abundantly.

Two miles to the westward of Bossessame, steering south 3 leagues, will carry you to Kanyabac island, in a depth of 8 to 20 fathoms, red sand and shells. To the westward of this track are the Hog islands, four in number; the northernmost, Corett, appearing remarkable, being covered with large trees. The eastern side of Kanyabac may safely be approached within a mile, in 6 to 10 fathoms. The S. E. point of the island, called Barel, is high and bold, to the westward of which is a small cove called Manel, where the bottom is good, but the depth shallow. A course S. W. ¾ S. (S. 30° W.) 13 miles, will take you two miles of the western side of a very extensive bank, which lies to the northward of Cavalho island, in 10 to 20 fathoms. Continuing the same course, a similar distance, you will reach the eastern shore of Orango island; and also breakers, which stretch more than two leagues off to the S. W. of it. Any course from hence, between S. S. E. and S. W. by W. (S. E. ½ S. and S. W. ½ S.) will lead clear of all danger, and out to sea.

Kanyabac is of moderate elevation, and higher towards the south than the north end. *Orango* is the most considerable of the Bissagos. Its eastern part is not very high; its S. E. point is called Cape Cameleon, and is remarkable from several spots of yellow sand, which form a striking contrast to the brown appearance of the coast. *Pullam island* derives its name from the large trees with which it is covered. It is not a mile in extent in any direction, and is little above the level of the sea; its shores are rocky, and difficult to land on, from the heavy surf breaking on them. It is bounded from S. W. to E. S. E. by flats, which extend 4 miles, and constantly dangerous for large vessels to approach near it.

H. M. S. Leven arrived on the 21st of April, 1821, off the Bijooga islands, and anchored between Yomber and Orango; upon the latter many natives and herds of cattle were seen. On the following day, the Leven grounded upon the shoal, at half a mile from the east shore of the isle Bawack, between Kanyabac and Orango, where she lay in a perilous situation until the next tide, when she happily got off. The idea we had been led to form of these islands was extremely erroneous; as, instead of being low and marshy, with scarcely a channel for boats between their muddy shores, we found them a cluster of the most beautiful, fertile, and inviting islands, with moderately high and bold shores, separated by deep water, and containing many fine harbours; most of them being inhabited, and each village having its independent ruler. According to the customs of these people, every vessel stranded upon their shores is forfeited to the chiefs or people; in consequence of which, they considered that they had a just claim to the Leven, when she lay grounded near Bawack.

Extract from the Nautical Magazine, page 207, *vol.* 2. "The principal feature in the character of the Bijooga Indians is avarice, which can only be gratified by the possession of whatever they see. By their importunate demands, and the manner in which they received anything given to them, they seem to believe that the visits of strangers are only for the purpose of making them presents. They received a few baubles from us with some expression of pleasure in their features, but thought of no return, and seemed to consider the presents as a matter of course. During the last forty years they do not appear to have advanced one step in civilization. Their treatment of strangers, and the difficulty of access to their islands, will long perpetuate their barbarous condition. An inordinate spirit of revenge and retaliation is the spring of all their actions, and kindles frequent animosities. The slightest provocation occasions dispute; the least unintentional wrong must be redressed. The nobler attributes of our nature are unknown to them, and their minds are alienated from all moral improvement. Pretexts for indulging this passion will never be wanting; the restless and inflammable tempers of the Bijoogas will always lead them to detect or occasion some cause of offence, and the objects of their revenge will be watched and pursued, till the most rigorous atonement shall have been made.

"In justice to them, however, it must be observed, that there is too much reason to believe that they have not always been treated fairly by the few white people with whom they have had intercourse; and there is little doubt that their history would discover much that might be adduced in extenuation of their singular manners. It is said that the first white man who visited Kanyabac imposed on the natives; a circumstance which may account for their behaviour to strangers. The result is, that they are insincere and unjust in their communications,—one which often obtains among people of more pretensions to civilization."

The Winds in the eastern channel are generally light in the fine season, particularly in the morning and evening. They set in gradually in the afternoon, and almost blow constantly from S. S. W. round by West, to N. N. W.; they remain but a short time at any intermediate point, and soon follow the direction of the land, which trends nearly N. by E. and S. by W. During the rainy season, easterly winds are prevalent, to which period winds from this quarter are entirely limited.

The Tides are as regular in the eastern as in the Jeba or Great channel. The length of the ebb is equal to that of the flood; the former sets to the northward, the latter to the southward; but the different points of the channel, and the irregularities of the bottom, affect those directions. The mean rise of the tide is from 12 to 15 feet. The strength of the stream varies according to the breadth and depth of the channel, being greater where it is confined than in the wider parts; it is, consequently, more considerable in the strait of Bulama, and the Honey Island channel, than in any other part. Nevertheless, it seldom exceeds 2½ miles per hour, but is frequently as much as two, at two miles to the westward of Pullam island. It is high water, at full and change, at 10 *h.* 15 *m.*

The coast, to the south-eastward of the Rio Grande, is shoal and dangerous to some extent from the land. Eight leagues S. E. ¾ S. (S. E. ¾ E.) from Pullam island, is the rocky bank of Alcatras, on which is a small islet 50 feet high, surrounded by breakers, with reefs two miles in extent, both from the N. W. and S. E. Between Alcatras and the river Nunez there is another dangerous reef, named by Captain Owen, in 1826, the *Conflict reef*, the western side of which is 14 miles, to the S. E. from the Alcatras, and its breadth each way is between 3 and 4 miles. Two other rocky banks lie within a distance of 8 miles to the southward, having a depth of 12 to 16 fathoms, near the most southern extremity, distant about 30 leagues W. S. W. from the entrance of the river Nunez.

The River Nunez, or, as it is called by the natives, Kakoondie, is much inferior in size to those previously mentioned. Its whole course probably does not exceed 250 miles, while the Rio Grande runs more than 400; but it offers a safe navigation to a great distance from the sea. It rises in that chain of hills which separates Senegambia from Sierra Leone, near 13° W. longitude, and its general direction, for about two-thirds of its course, is to the west, and the remainder to the west of south. In the upper part of its course it is full of rapids and falls. It becomes navigable, for vessels of moderate size, above the settlement of Debucko or Rebucko, and up to this place the tide ascends. From this place downward, the general depth of the river may be stated at 2½ to 3 fathoms at low water, with a rise and fall of about 12 feet. The river has three channels at its mouth, two of which are navigated by vessels. The northern admits only vessels drawing less than 12 feet, but the southern may be entered by large ships. They are separated from one another by an island called Sandy island. The low country, near its mouth, is uninhabited for want of fresh water, and the first settlement, Walkeria, occurs at the distance of 70 miles from the sea, measured along the course of the river.

Vessels bound to the Nunez should make the land in 10° 31′ N., or, if coming from the southward, should, at least, not advance into less than 7 fathoms, till in that latitude. They will then approach the river, steering E. ¼ S. (N. 75° E.) through regular soundings; and it is necessary to remember, chiefly, that with a flood tide, there is a dangerous rocky flat on the starboard beam, going in; while, on the other hand, a vessel may play with the edge of the breakers on the point of Sandy island on the larboard side. The constant warning, also, "Keep in mud," which is familiar in all channels along this coast, should be here especially kept in mind.

The following are the directions given for it by Lieutenant Bold :— "When Cove point (the N. W. side of the entrance) bears about N. W., and the south point on its opposite bank East, you will be in 7 or 8 fathoms, in a fair way for the river. Due south of the last-mentioned point there are breakers, and a shoal 6 miles in breadth, some parts dry at low water. Sailing in, keep over within a mile and a half of the south point, for the river is interspersed with banks, to nearly 5 miles from the opposite side. From hence to North point, the entrance to Talagos river, it is 2 leagues, with a channel of 4, 5, and 6 fathoms; but between which there is a shoal to be avoided, by not bringing the North point to bear further north than E. N. E. The channel there is only one mile and a half broad, but good anchorage round the point in 5 fathoms, abreast of the river. At the mouth of the Nunez it is high water, on the full and change, at 11, with a rise of 9 feet. The river is navigable 10 leagues up, for vessels of burthen, the least water being 3 fathoms over the flats opposite the river Talagos. The river Nunez has been known as a place of trade in ivory, where, as at the rivers Pongo, Dembra, &c., it is very abundant.

A small isle, called *Young Gonzales*, lies about 5 miles to the eastward from the regular entrance of the Rio Nunez. It is the southernmost of three, having channels communicating with the Nunez; and about 5 miles true east from it is the mouth of the river Cappatches. From Young Gonzales a long dangerous flat of rocky ledges, gravel and sand, extends S. W. (by compass) nearly six miles. At low water, a patch, three-quarters of a mile in length, has over it only six feet of water. The Cappatches is a trading river, but shallow, and frequented only by boats, or vessels not drawing more than 4 feet of water.

About 9½ leagues to the south-eastward of the Nunez is Cape Verga, a low point, being the westernmost of the Caxa islands. The high mountains, 3 leagues inland to the northward of the cape, will serve to recognise this part of the coast, as they may be seen 15 leagues distant. Thus bearing East, (E. N. E. ½ E.) are they equally useful to ships bound to the Rio Nunez, which, with this bearing, will clear the banks lying without the river, at 5 or more leagues to the south-westward. About 7 leagues S. S. E. $\frac{1}{2}$ E. (S. E.) from Cape Verga is the entrance to Rio Pongo, which forms itself into several channels, each impeded by a bar of mud or sand. The best of these is over the Rissing, or Mud bar, which extends more than 2 miles to the westward of the main channel of the river. On its north side are 6 feet, about the middle 12 feet, and on the south side 8 or 9 feet, at low water. Two hills up the country, bearing E. N, E., serve as a mark for the bar, distinguished also by a grove of palm trees on the north side.

To sail over the Mud bar, get the river open, and steer in N. E. by E., keeping the two hills, which are moderately high, a cable's length open of the North point, by which you will carry 4 fathoms in depth at high water, or 2 fathoms at low water. Anchor in 7 or 8 fathoms, in the middle of the river, abreast the palm trees on the larboard hand, which trees appear to extend about two miles in length ; then send your boat up the river for a pilot, or fire a gun twice or thrice, at intervals of about an hour, and in all probability a pilot will come off to you. If bound to this place in the night, approach no nearer than to the depth of 4 fathoms, until daylight. If beating in, stand no further to the northward than to bring the two hills in the middle between the two points of the river; then stand to the southward to 2 and $2\frac{1}{2}$ fathoms. If going in, with a fair wind, bring the north point of the river, with its palm trees, to bear N. E., and run in with it bearing N. E. by E. On entering, keep on the south side within the bar, as the flood-tide sets on the northern breakers. Should you here have $1\frac{3}{4}$ fathoms, you need not fear, as the bottom is all of mud. The river hence lies east and west, about 8 miles; and its depths, in mid-channel, are 3, 4, 7, 6, and 5 fathoms.

The Sand Bar is 5 miles to the southward of the Mud bar, and its entrance is more intricate, therefore not to be attempted without a pilot. This is, nevertheless, the mouth of the Rio Pongo, properly so called. In the best channel, at the entrance, the depth is 12 feet at low water, and within it are 4 and 5 fathoms. A small sand bank having showed just above water, at high tide, to the northward of the Sand bar, and mangroves having taken root on it, the bank consequently increased, and the natives have planted palm trees on it. There is said to be a passage of 3 fathoms to the northward of this islet. Vessels bound to the Rio Pongo sometimes make the high land of Cape Verga, and sometimes go to the Isles de Los for a pilot, although one is not always to be found there. Some run in by their latitude, taking care to sound frequently, as soundings extend out a degree and a half to the westward. The time of high water here, on the full and change, is 9 hours; the rise about 10 feet.

Dembia River is distant about 8 leagues to the south-eastward of the Pongo. It is navigable for small vessels, and is chiefly resorted to by the Portuguese for ivory. Two leagues from this is Sangaree river, and $6\frac{1}{2}$ miles to the south-westward of the latter is Point Tumba. The high volcanic land called Mount Suzos, or Sangaree, lies to the eastward of Tumba point; it has a regular conical peak, except on the south side, where there is a protuberance half-way up, and serves as a very useful mark for the Isles de Los, which lie westward about $2\frac{1}{2}$ miles from the point.

Isles de Los. The largest of these islands is named *Tamara*, and is the most western of the group. The easternmost, on which the English factory is established, lies nearly north and south, having a high wood-crowned hill at each end, giving it the appearance of two islands at a distance. *Crawford's island* lies between the two former, and three smaller ones to the south complete the cluster. Tamara may be seen 7 or 8 leagues in clear weather; it is moderately high, and thickly wooded, in shape resembling a crescent, its concavity to the S. E. forming several good anchorages of 4 to 6 fathoms. These roadsteads may be entered either from the northward or the southward, giving the points of the island a berth of three-quarters of a mile, by which the *Arethusa reef*, extending a quarter of a mile from the north point, will be avoided. Fresh water may be had in abundance, from a spring near the principal anchorage.

The easternmost, or Factory island, is 4½ miles in length; the roadstead is on the eastern side, and is very safe in dry weather; but during the rainy and tornado season there is little security beyond that of the goodness of your cables and anchors. The English establishment now extends to Crawford's island, which is considerably elevated; from the N. E. of this island are shoal flats extending to the distance of nearly two miles, they are one mile in breadth, and dry, on the outer edge, at low water; in every other respect, except Cooper's rocks off Shark island, the channel through the islands is perfectly safe.

The Isles de Los are excessively commodious for trade, being most easy of access, and commanding a communication with the numerous rivers in the vicinity of the coasts. Good fishing may be found about all the islands with the seine, and an abundance of turtle, with good fresh water. From hence Sangaree mount is plainly seen in a northerly direction. It may be an useful remark further to observe, that, north of the islands from the Gambia, the soundings are all sandy, which change immediately to mud on the south.

Directions for Sailing from Cape Roxo to the Isles de Los. *By the Baron Roussin.* "A vessel starting from a point at 4½ leagues to the westward of Cape Roxo, which will be a little without the meridian of 17° W. to the parallel of 10° 40′ N. will be outside of all dangers. From hence a course S. E. ½ E. (S. 68° E.) and distance 68 leagues, will lead her to the west point of Tamara island. On this course the soundings will never be under 8 fathoms until near the shore of the island, and those on the first course will be considerably more. From the parallel of Cape Roxo to that of the western breaker 11° 31′ 32″ N., at a distance of more than 4 leagues to the westward of the meridian of 17° the depth will increase progressively from 8 to 28 fathoms, and the bottom be entirely of mud. This remark may be depended on to shew that a vessel is not far to the southward of the parallel of the Jeba, or Great channel; she cannot, at the utmost, be more than ten miles from the positions already given.

"From this point, as far as the parallel of 10° 40′ N., the bottom is nearly free from mud, and on passing to the southward of the parallel of 11° 20′ very slight traces of it remain, but are succeeded by a bottom of fine white sand, sand and gravel, sand and broken shells, with a depth varying from 12 to 50 fathoms. A vessel having left Cape Roxo and arrived in latitude 10° 40′, may thence steer a direct course for the Isles de Los. The S. W. edge of the Bissagos follows a gentle curve, from the western breaker as far as the southern one, that of La Bayadere. The bottom in this part presents a singular peculiarity. Amongst the fine white sand, sand and broken shells, sand and gravel, of which it is most frequently composed, a greenish coloured sand is sometimes found. The depth decreases very gradually from 50 to 9 fathoms, from S. W. to N. E. The remainder of the course to the Isles de Los passes over deep soundings, as much as 50 fathoms, at the point of departure, and the least depth is 12 fathoms.

"No precise rule can be given as to the changes in the depth along this track, nor as to the various nature of the bottom. It is known only that the ground, in the space passed over by this course, seems to be furrowed with channels, which, commencing from the southern extremity of the eastern channel of Bissagos, diverge toward different points between S. W. and S. S. E. *true*. The furrows above-mentioned appear to have been caused by the regular tides in the mouth of the Rio Grande, and prove, beyond a doubt, that the outlet of the same channel is partly caused by that river. With respect to the nature of the bottom, it is of fine sand, in some places mixed with broken shells, small pieces of brittle rock, and gravel, which appeared to be only a covering to beds of a whitish volcanic sandstone, into which the lance penetrated but three or four inches, and did not hold. A muddy bottom is not found until about 10 leagues to the westward of the Isles de Los, and then only in small quantity, till within a very short distance to the N. W. of those islands.

TIDES. "In proportion to the distance from the mouth of the Jeba, or Great Channel of Bissagos, either to the northward or southward, the tides lose their regularity. This interruption in the tides is evident in going to the southward, as, at a few miles south of the parallel of the western breaker, 11° 31′ 32″ N., they are no longer perceptible, even on the edge of the Bissagos. No decided course of the current was ascertained to exist, but it is generally allowed that the waters have a greater inclination to flow to the southward than to the northward; and it may be presumed that it follows the direction of the winds on the western edge of the Archipelago, but it is seldom found to be considerable."

Between the Isles de Los and the sharp low point of Tumbo, there is a safe channel, through which ships may carry 3 fathoms of water, and which may be at times highly convenient to use, or even to run through the group; yet, without some good reason for so doing, it will always be adviseable to go outside the islands, where certainly no dangers are to be met with.

From TUMBO POINT to MATACONG ISLAND the bearing and distance are S. E. by S. 7½ leagues. Tumbo point is the S. W. extremity of an island bearing the same name, and separated by a very narrow high-water channel from the main land. To the southward of this point, the land falls back to the north-eastward about 7 miles, forming an extensive but shallow bay, at the bottom of which is an inconsiderable stream, called Tannaney river. In the extensive bay between the Isles de Los and Matacong isle, no detached dangers exist. The coast is safe to approach, the soundings being gradual, and always affording good anchorage; and it is in all parts accessible to large ships, to the distance of 6 miles, which generally may be considered sufficiently near to distinguish the land, and often to recognise the mouths of the rivers.

MAHNEAH RIVER is about 12 miles E. S. E. from Tumbo point; is, at low water, scarcely accessible to the smallest coasting vessels, but the rise of tide exceeds 2 fathoms. To enter this river, it is necessary only to bring the western point of the entrance, while at the distance of 5 miles from it, to bear N. E. by E. ½ E., and then steer toward it in that direction, until you get close to the S. W., mud bank, when you may proceed along by the edge of that bank, in a convenient depth, according to circumstances. Within the river, the depths at low water are from 6 to 10 feet only. The water discharged from this river must be very great, as the ebb tide runs out with great rapidity.

RIVER MOREBIAH. The mouth of this river is about 18 miles S. E. by E. ½ E. from the Isles de Los, and though its breadth within the points nowhere exceeds half a mile, yet it is far superior to the Mahneah. In approaching the coast abreast of the river, with its opening bearing

E. N. E. ½ E., distant 9 miles, and Matacong island S. E. by E. ¼ E., you will have 6 fathoms of water on black mud; from this situation the depth will decrease gradually, on a bottom of the same kind, to 8½ fathoms at the entrance of the channel. With the rounding of the land, between the rivers Mahneah and Morebiah, bearing N. N. E., the east point of the entrance E. ¾ N., and the middle of Matacong island S. S. E. ¾ E., you will have that depth. From this position steer N. N. E., until the east point of the river bears E. ¼ S., and then stand in toward this point, or about East; but remembering, that both flood and ebb set partially over the extensive shoals that form the S. E. side of the channel; some of these, however, being dry at low water, and nearly so at high water, their steep boundary is perfectly discernible. In the elbow of the channel, the least depth is 1¼ fathom at low spring ebbs: this depth, however, continues but a short way, and, from the time of altering your course to the eastward, or steering straight in, you will seldom have so little as 2 fathoms. Beyond the east point, the depth varies from 4 to 6 or 7 fathoms, and for the extent of 7 miles up the river, it appeared to be clear of all danger. It is high water, on full and change days, at 7 *h.* 40 *m.*, and spring tides rise 11 feet.

MATACONG ISLAND is about a mile in length, surrounded by mud-banks and rocks in all directions, so that no vessel of any burthen can lie at anchor within two miles of it. The channel which divides it from the main is nearly three-quarters of a mile broad, but its muddy bottom, at low water, is left dry. From Matacong island the coast trends to the eastward a little more than 3 miles, where it turns abruptly to the northward, and forms the west point of the mouth of the **RIVER FOREECARREAH**, the interval being fronted with sand and mud banks, which extend more than 3 miles to the southward. The entrance of this river is above 2 miles wide, and the least depth is 1 fathom at low spring ebbs. To sail in, it will be necessary to pass close to the banks which project from the west point, but at the same time to be cautious in approaching them, as they are steep-to, and dry at low water. The outer sand will be apparent, even in fine weather, at any other time than high water, and if seen, it may be safely skirted in 2 fathoms near low water, or in 4 at high water; and that you may not get in at the back of this sand, do not bring the highest part of Matacong island to the westward of N. by W. ½ W. until the west point of the river bears N. E. ¼ E. You may then safely enter, recollecting, as a guide, that you should always keep the western side aboard, off which, however, you will have to edge occasionally, to avoid the banks; yet this river is of very little consequence, as a ridge of rocks nearly crosses it at a short distance from its mouth. The ebb tide here is extremely rapid, and the overfalls, in the vicinity of the rocks, are dangerous to those who do not possess a local knowledge of the river.

The **RIVER MELLACOREE** is at present of considerable importance in the timber trade, and better objects for marks than any of those already described. In entering, observe that, at 8 miles off shore, there are 6 fathoms of water, and, with the river's mouth bearing E. by N., it will be fairly open. Steer toward it, in that direction, until the soundings have decreased gradually to about 3 fathoms, at low spring ebbs, with the following bearings:—East point of Yellaboi island S. by E.; Sallahtook point, distinguishable by the trees being higher than elsewhere, bearing S. E. ½ S.; Bentee point, known by a remarkably large tree, E. by N.; the outer point of Tanah river, E. N. E. ¼ E.; and the rounding of the land, to the northward of the river, N. E. ½ N.; you will then be in the fairway. The **MIDDLE GROUND** is steep and dangerous, but the soundings on the southern side are gradual, though the mud-bank is very wide; borrow, therefore, rather on that side, until nearly as far as Bellangsang point, when you must haul over to the mouth of Tannah river, and there anchor. Higher up there are some patches of rocks in the middle of the river, but at low water they are seen, as well as the deep water-channel between them, which is one-third of a mile in breadth, with a depth of 7 to 9 fathoms. By keeping the East point of the river Tannah bearing N. W. by W. ¼ W., you may pass through this channel in safety; and, there being no further danger, you may ascend the river to the factories established below Devil's island, on the south shore; the general depth varies from 5 to 9 fathoms. Here it is high water, on full and change days, at 7 hours 40 minutes; spring tides rise 11 feet.

Besides the channel on the south side of the Middle ground, there is also an inferior one to the northward; to enter which, when 5 or 6 miles off shore, bring the west point of Tannah river to bear E. ¾ S., and by carefully using the lead, you may proceed in with safety; for, although at its termination, it takes a slight turn round the N. E. corner of the Middle ground, yet this is generally so well indicated, that you can scarcely be deceived. On account of the soft nature of the bottom, vessels may ground in several places in the vicinity of the Mellacoree river, without being injured; but a patch of foul ground, which surrounds the long reef off Sallahtook point, must be carefully avoided.

From Sallahtook point the coast trends S. S. E. 7 miles, to a small river, on the western point of which is situated Sangahtook factory; and about 1½ mile to the westward of this point is Yellaboi island, surrounded by mud-banks that are dry at low water. Four miles S. E. from Yellaboi is a much larger island, with extensive mud-banks to the north-westward, but with a deep channel between it and the main. It is called Corteemo, and lies in the mouth of the rivers Scarcies. These rivers are known by the names of Great and Little Scarcies; the former is navigable for large ships, but the other is adapted to very small vessels only, and requires very careful pilotage.

THE CHANNEL INTO THE GREAT SCARCIES RIVER* is the best on this part of the coast; for, although the banks are steep, yet it is broad and deep, and a ship of the line, by taking a proper time of the tide, might moor off the inner point of Yellaboi island. To sail into this anchorage, bring the west end or highest part of Yellaboi island to bear E. N. E., and steer toward it in that direction, until you decrease the depth to 5 or 4 fathoms, which will happen suddenly. Now change the course, and, keeping in 4 to 5 fathoms, steer direct for Inglis Pahboyeah river, bearing E. ½ N., taking care to keep it well open of the inner point of Yellaboi island, until the west point of that island bears N. by E. ¾ E., when you must haul directly in toward it, and, skirting along the steep mud-bank which borders the south side of the island, steer for its S. E. point, close to which you may anchor in 4½ fathoms. In reaching this anchorage, the least depth you will have to pass over will be 2½ fathoms at low spring ebbs; and this occurs only after hauling in for the island, and running along the edge of the mud-bank. It is high water here, on full and change days, at 7 *h.* 10 *m.*, and spring tides rise 11 feet.

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* This channel has been buoyed,—the expense borne equally by Mr. Henry Weston and myself. The bearings of the inner or bar buoy are to the west end of Yilleaboyah, N. 2° W., and to where the huts are on the east end, E. ½ N., compass bearing. The outer buoy is situated on the northern edge of the outward middle bank. The inner buoy is situated on the shallowest part of the bar, having at high water, common tides, 16 feet; but at the distance of a quarter of a mile, due north from the buoy, there are 3½ fathoms at high water, common tides. The earliest opportunity shall be taken to remove the inner buoy further north, which will render the channel safe for vessels drawing 16 feet water, at common tides, and 18 to 19, at high water, spring tides. If you apply the bearings to the chart of the Scarcies, they will give the place of the inner buoy one quarter of a mile further in, as above. In a line with the west point is where I purpose to lay it, in 2½ fathoms, low water.—*John Mac Cormack, Agent to Lloyds.*

SIERRA LEONE. From Yellaboi island the Cape of Sierra Leone bears S. by W. ½ W. (South) 25 miles. This cape, with the coast eastward, forms the south side of the great river, bearing the same name. The coast northward of the mouth of the river is low and level, bordered with a shoal bank, three miles in breadth, and which has upon it several dangerous rocks; but on the south side the land rises into hills, which are properly the Sierra Leone, or Lion Mountains, that have given name to the river and country. The mouth of the river, which is two leagues wide, is obstructed by an extensive sand-bank, called the *Middle Ground*, which in many parts is dry at low water, but having on each side a passage; that on the north, however, is only fit for small vessels, in a depth, half a mile from shore, of 2 and 3 fathoms. The principal channel is that between the Middle bank and the cape, being fit for vessels of every burthen, varying in depth from 5 to 10 and 12 fathoms, and is about two miles in breadth.

The *Carpenter* is a dangerous rock, lying at the distance of nearly a mile W. ¼ N. (W. S. W. ½ W.) from the N. W. extremity of the cape. This rock is clearly seen at half tide, and may always be distinguished by the breakers over it: the flood stream sets directly thus, the channel formed by it and Cape Sierra Leone; and though it may safely be approached within half a mile, yet it will be proper for those beating down the river, with the sea breeze and a strong ebb tide, to be careful and not approach so near.

On the starboard side of the river Sierra Leone, the coast is indented with several inlets, respectively named Cape, Pirate's, Whiteman's, St. George's, or Freetown, Susan's, and Thompson's bays; the latter of which is bounded on the east side by Farran point. FREETOWN, the capital of the colony, stands on the bay of that name, and is protected by fort Thornton, which stands on the highest ground in its immediate neighbourhood, except that on which the Martello tower is erected at a distance of a quarter of a mile. The town is situated at the foot of the range of mountains already noticed, whose general height is estimated from 2000 to 3000 feet.

Ships proceeding from Cape Verd to Sierra Leone, and having reached the latitude of 9° 15′ N., should endeavour to gain soundings on the edge of the great bank from the Bissagos to Cape St. Anne. From a depth of 50 fathoms, grey sand, you may steer a true course S. E. by E., until you arrive in the parallel of the cape, in 8° 30′, from whence a true easterly direction will enable you to distinguish the mountains of Sierra Leone, which are often seen at a distance of 14 leagues, though, in hazy weather, very prevalent on this coast, they are often invisible 6 or 5 leagues. It is recommended to make a constant use of the lead, when approaching towards the entrance; should the depth gradually vary from 20 towards 14 or 13 fathoms, and suddenly shallow to 7 or 8 fathoms, you will not be more than 3 leagues distant; and should this happen towards evening, it will be better to anchor till daylight. Proceeding as we have thus directed, and having made the high land of Sierra Leone, you should bring it to bear E. S. E. ¼ E. (East.) The cape makes in a small low point, having a ridge of cocoa-trees close to the water's edge; and when within 3 leagues of the cape, you may observe the Carpenter rock, with the sea constantly breaking over it. Having passed the cape within a quarter of a mile, in 9 or 10 fathoms, a S. E. by E. ½ E. (E. ¾ S.) course, 3¾ miles, will carry you to Freetown, where there is anchorage in 14 or 15 fathoms, muddy bottom, a quarter of a mile from shore, with Fort Thornton bearing S. by W.; the east point of the bay S. E. ½ E.; and the west point, called King Tom's point, W. by N. Moor with the best bower to the eastward. The watering-place here is very convenient, and the water excellent. You fill your casks in the boat, with a hose, which leads from a cascade.

In sailing up the river, do not approach nearer to the Middle bank than 7 fathoms. Farran point is high, and has a house upon its summit. It has sometimes, in hazy weather, been mistaken for Cape Sierra Leone, although two leagues to the eastward; the consequence of which has been, that vessels have touched on the Middle ground,—a circumstance which serves as a useful mark to obviate, as Farran point, bearing S. E. by E. ½ E., well open to the north of the cape, points out the mid-channel between that bank and the Carpenter. Vessels coming in more from the northward will clear the west end of the Middle ground, in 3½ fathoms, with King Tom's point on with the centre barrack, bearing S. S. E. ¾ E. (S. E. ½ E.)

The Tide at Freetown, flows on the full and change days at 7 *h.* 50 *m.*, and rises 12½ feet. During the rainy season, the tide is very regular and strong, running 6 and 7 knots an hour, and the ebb sets rapidly on the Middle ground. In the dry months, it commonly flows on shore at 7 *h.* 30 *m.*, with 7½ hours' ebb, and 4½ flood. In this season the ebb runs 2½ miles an hour, the flood only 2 miles.

False Cape bears S. by W. ½ W. (S. ¼ E.) from Cape Sierra Leone, distant about 4 miles, and is situated to the southward of a slender sandy bay, bordered with trees. The cape is a conspicuous projecting point. From False cape to York, or the Sisters' river, the coast trends S. ¾ E. (S. S. E. ½ E.) 12 miles; and from York to Cape Chilling S. ½ W. (S. by E.) 7 miles. At Cape Chilling the chain of Sierra Leone mountains terminate, after having made a high double land, which is seen a great way off. The cape itself is low, covered with trees, and appears, at 3 or 4 leagues distant, like a small island; but the interior, or south extremity of the range of mountains, is extremely high, and may be seen a distance of 14 or 15 leagues.

The Banana Islands are separated from Cape Chilling by a channel 12 miles in breadth, and are chiefly foul and rocky. A vessel may anchor to the northward of them, with the N. E. extremity of the group bearing S. S. E. ½ E., and the Western part S. S. W., bearing a depth of 7 and 8 fathoms, towards the island, but little more than 2 fathoms, a cable's length from shore. There is also anchorage to the southward; but the best position is in 5 fathoms, two miles from shore, on clayey ground, the N. E. point bearing S. ½ E., and the highest hill S. by W. ½ W. The best landing-place is in a sandy bay, at the S. W. end, where wood and water may be obtained.

Yaury Bay is formed by Cape Chilling on the north, and Sassa point on the south, distant from each other 6 leagues, S. S. E. and N. N. W. This bay is encumbered with a shoal which stretches 4 miles from the coast, many parts of which dry with the ebb, and have little more than 4 feet at high water. The Plaintain isles and Bengal rocks extend 5 miles to the westward of Jassa point, on the flat between Yaury bay and Sherbro' inlet.

Tides. The tides divide off the False point of Sierra Leone. To the northward of that point, the flood runs to the northward; to the southward of that point, it sets to the south. Hence, at the Bananas, the flood is from the N. W., and the ebb contrary. Here the tide flows, on the full and change days, at 8 *h.* 15 *m.* During the equinoxes, it rises 9 or 10 feet perpendicular; other spring tides, 8 or 9 feet. At the Plaintain isles, it rises about a foot and a half more than at the Bananas; but at the Bashaw or Turtle isles, more to the southward, the rise is 6 or 7 feet, common spring tides.

SHERBRO' INLET is the channel between the main and Sherbro' island, the western extremity of which is called Cape St. Anne. The main land forms the north side of the inlet, and consequently the north side of the island forms the south side. From the extremity of the north side, the coast bends somewhat to the S. S. E. to Yallucka river, and is encumbered with a mud-bank and several shoals, as far as the river Bagroo, which is 6 leagues further. The north side of Sherbro' island extends 8 leagues to Jamaica point, the eastern extremity, and the coast between is bordered with an extensive mud-bank. About 4 leagues from Cape St. Anne, on this side of the island, is the remarkable tree named Little Pow Grande; and 3½ miles to the eastward of this spot is Pow Grande. Jenkin's village is distant 4½ miles from the latter, and affords anchorage for large vessels in 5 to 7 fathoms.

Vessels bound to Sherbro' inlet should steer from the west end of the Bananas, toward the Bengal rocks, S. S. E. ¾ E. (S. E. ½ E.) 14 miles, so as to give them a berth of about 3 miles. Having rounded these rocks, steer S. E. ¾ S. (S. E. by E.) 5 leagues, taking care to avoid the hard sand-bank on the east, which is steep-to. In running on, you may shoalen your water to 4 fathoms, on the flat of Yallucka river, upon the eastern side, and thence continue the same course 4 leagues further to the southern bank, making due allowance for tide, whether ebb or flood. The last course will lead to a mile and a half from shore, in about 4 fathoms of water, and without the edge of the bank. You may now run up along shore, for two leagues, to Jenkin's, taking care to avoid the edge of the middle ground on the north, which here leaves a channel of only half a mile between it and the shore.

THE BASHAW, OR TURTLE ISLANDS, consist of eight or ten in number, and are situated on a great bank, that extends to the N. W. of Sherbro', and S. E. to the shoals of St. Anne. The bank on which these islands lie is intersected by numerous channels, which are navigable for boats at high water, but are so complicated as to render description useless, and indeed of no utility.

THE SHOALS OF ST. ANNE. The limits of the bank on which these shoals exist, are but yet imperfectly known. The best authorities consider the northern extremity to lie in latitude 7° 56′; the south extreme, 7° 31′ 5′; and the western limit, 7° 48′ N., longitude 13° 29′ W. The shoals of St. Anne are divided by numerous channels, varying in depth from 6 to 10 fathoms. A narrow passage of this nature divides St. Anne's bank from that on which the Turtle islands are situated; but this, like the others, should not be attempted with the imperfect description we are at present in possession of. As a general caution to vessels bound from Sierra Leone towards the Gulf of Guinea, we should recommend a S. W. ¾ W. (S. W. by S.) course, 12 leagues; and having reached the latitude of 7° 30′, in the meridian of 13° 40′, a course S. E. by E., easterly, will take you somewhat more than 20 leagues to the S. E. extremity of Sherbro' island.

About 6 leagues from the river Shebar, on the coast to the eastward of Sherbro' island, is the river Gallinis, and from hence to Cape Mount, the coast is very low, having a fine sandy beach, and covered with trees.

CAPE MOUNT may be seen 25 or 30 miles, the land on each side being low, but somewhat higher on the north side, with a flat sandy beach to the eastward. The cape itself is distinguished by cliffs, which may be seen 4 leagues off. To fall in with Cape Mount, you ought to keep in the latitude of 6° 40′, having on account of the current, which sets toward the shore, frequent recourse to the lead, when you think yourself near the land. In the night, you ought not approach it nearer than to 26 fathoms, unless well acquainted. The roadstead lies to the westward, where you may anchor in 10 to 15 fathoms, bringing the extremity of the cape to bear South, or S. by E. In fine weather, vessels may ride securely between Cape Mount and the river of that name to the north-westward; but in the rainy season, during Southerly and S. W. winds, there is a tremendous sea and breakers on the shore, so that, during these months, vessels should lie well out, as otherwise it may be difficult to get to windward.

CAPE MESURADO is high, distant about 43 miles S. E. by S. (S. E. by E.) from Cape Mount; the coast between is low, having a white sandy beach. At the distance of 2 miles from the shore is a depth of 10 fathoms. Vessels may lie in any depth from 5 to 15 fathoms, off the river St. Paul, which lies about 3 leagues to the northward of Cape Mesurado; and there is also anchorage in 10 to 15 fathoms, muddy ground, with the cape bearing S. E. by S., distant 2 or 3 miles. The rainy season, between Cape St. Anne and Cape Mesurado, usually commences about May, and terminates in October; it is generally accompanied with thunder and lightning, and the sea sets so hard to the N. E. along the shore, as to cause a most violent surf on the shore.

Cape Mesurado is an elevated promontory, almost perpendicular on the north side, but with a gradual declivity towards the sea on the south. There are regular soundings, of 20 to 15 fathoms, muddy bottom, at 8 miles off shore, along which the current sets strongly. At 2 or 3 miles off shore, with the cape S. E. by S., is a depth of 15 to 10 fathoms, muddy bottom, and a common anchorage. With the cape bearing N. E., the land appears like an island, with trees rising out of the water to the north; and at 7 leagues off, it appears in its insular form, the land on each side being very low. In the winter months here, as at Cape Mount, vessels should lie out, on account of the heavy sea in the bay, and the southerly winds, which would otherwise render it very difficult to get out to windward. To anchor at the cape in the rainy season, bring the mount to bear S. E., distance off shore 3 or 3½ miles, and come to in 14 fathoms of water.

The RIVER JUNK is distant about 30 miles S. E. by E. from Cape Mesurado, and may be known by a remarkable hill, in the shape of a saddle, lying inland. Vessels may anchor in 15 fathoms, clear sandy ground, with the entrance of the river bearing N. N. E., and the saddle hill N. E., distant 4 miles from the shore. This will be found convenient during the rainy season; but in fine weather, you may lie nearer the shore, in 12 fathoms. Fresh water may here be obtained, but caution must be observed with the inhabitants, who are not so friendly as those to the northward. There is said to be a small reef, close in shore, at 6 miles to the westward from the mouth of the river.

LITTLE BISSAW, or *Picaniny Bassa*, is distant about 3½ leagues S. E. from the river Junk, and has a dangerous reef, that extends 5 miles to the S. E.; vessels therefore should not anchor in less than 16 fathoms. Two and a half leagues from Little Bissaw are the Nine Trees and Bullam town, the former being an excellent mark for this part of the coast. The anchorage off Picaniny Bassa is with the Nine Trees bearing S. E. by E., and a large and remarkable house, the residence of the chief, N. E. by E.

Between Cape Mount and Bassa, the trade of the coast has generally been a mere system of barter, called the *Bar Trade*, from the value of all merchandise being estimated at so many bars of iron. Ivory is the staple commodity, as well as a fine species of cam-wood. Those who possess ivory, being anxious to trade, readily come off in canoes, provided the vessel comes to; but great caution is required. Your intention to trade should be signified, on arrival, by firing a gun and hoisting your colours, on which the natives will come off; fires will be made on the beach, by which their desire to trade is indicated.

THE GRAIN COAST. To the eastward of Bullam is the river St. John; about two miles to the southward of which is the town of Grand Bissaw, a place of some trade, situated in a small safe cove of 6 to 3 fathoms, and bounded on the west by two large rocks above water, between which and the shore a vessel may moor, in case of necessity, in 2½ or 3 fathoms. The anchorage of Grand Bassa, in the rainy season, is in 15½ fathoms rough blue marl, with the Nine Trees bearing north, distant 6 miles; in the dry season anchor nearer shore in 12 fathoms.

Somewhat better than two leagues to the southward of Bassa cove is Taboccanee rock, distant about two miles from the village of that name, on the shore: a reef extends from the rock nearly six miles to the westward, between which and the shore there is a navigable channel for boats only. The distance from Grand Bassa point to the river Sestros is about 40 miles, the coast between is generally foul, and requires light chain cables for anchoring; several villages distinguish this part of the shore, one of which, Grand Currow, may be known by a high hill inland to the N. E., and that of Manna by a clump of high reddish trees. The River Sestros, or *Sesters*, is recognised by a hill in the interior, and the land appearing double; it is only fit for boats, as its entrance is impeded with rocks two miles from shore, where there is anchorage in 10 fathoms, muddy bottom.

Two and a half leagues from the river Sestros is the rock of that name, known by several others around it, and a palm tree on the point; three leagues further is Sangwin, distinguished by the Devil's rock, with a bushy clump on the top, distant two miles from the town, to the southward of which there is anchorage. From Sangwin to Settra Krou, a distance of 36 miles, the coast is generally foul, and affords but partial anchorage. The towns of Baffa, Battoa, Tassou, &c., which lie in this space, are unimportant. To the southward of Settra Krou is Krou Settra, before which there is anchorage in 15 or 16 fathoms, sandy ground: this place may be known by its high bare trees, appearing like masts; but in approaching be careful to avoid a dangerous reef, extending 3½ miles from the shore, bearing, in a line with the town, E. N. E. Six miles from this shoal is the *Swallow rock*, under water, lying off Wappou, from which it bears S. W., 2½ miles. Wappou has a single tree on the beach, and has a large rock lying to the westward, named Flat isle. Niffou, Drou, and Baddon lie to the southward, and afford some trade in ivory, but the coast hereabout is foul

We now reach the town of *Grand Sestros*, or Sesters, distant 15 leagues from Settra Krou; this is a populous place, and may be known by a large single tree on the beach, and a high round rock 2½ miles to the southward. There is anchorage, in 20 fathoms, 4 miles to the southward of Garraway, a town situated 7 miles to the south-eastward of Grand Sestros, which may be known by three hills on the west, and a clump of trees on the extremity of its southern point. Rock town, situated 3½ leagues from Garraway, takes its name from a reef that extends from it 3 or 4 miles, partly above and partly under water; between this and Cape Palmas is Cape Palmas Little Town, a larger one of that name lying near the pitch of the cape. The coast hereabout is foul, and the depths irregular, so that it may be proper for vessels not to approach nearer than 20 or 25 fathoms.

CAPE PALMAS is moderately high, and should not be rounded in less than 28 fathoms. It is well wooded, having several gentle acclivities towards the sea, and red clay fissures appearing like roads at a distance. The town stands on the eastern elevation, and is surrounded by a large mud wall. The *Cape Shoal* lies 3 miles to the southward of the cape, being divided from the shore by a depth of 13 fathoms; but the current here sets with great rapidity to the S. E., though small vessels may anchor with security near the shoal, making due allowance for this circumstance. *Coley's Rock* is a submarine danger, varying in depth from 6 to 10 feet; it is surrounded by a depth of 7 fathoms, increasing to 13 at no great distance. This rock is distant about 6 miles to the westward of the Cape Shoal, Cape Palmas bearing E. S. E., 3½ leagues, and Garraway trees N. ½ W., 4¼ leagues. There is another sunken rock to the eastward of Cape Palmas, upon which H. M. S. Athol struck, on the 16th December, 1830. The ship was running along shore, in 12 fathoms water, at the distance of 3 or 4 miles from the land, and 1½ mile from the outermost breakers, when she struck on a sunken rock; the bearings from which were Grand Cape, Palmas town, N. W., westerly; a round rock above water, E. by N.; a clump of trees on the eastern extreme of the land, E. ½ S. *Variation about* 19° *W.* There were 10 fathoms on each side of the ship.

As a general caution to vessels running down this coast during the night, it is recommended not to approach nearer than 18 fathoms between Cape Mount and the river Sestros; between the latter and Settra Krou, it may be proper not to get into less than 20 fathoms, and from thence to Cape Palmas, 22 fathoms; but in approaching the latter, observe what has already been stated, not to round it in less than 28 to 25 fathoms, in order to avoid the dangers we have here described.

THE IVORY COAST. Five leagues to the eastward of Cape Palmas is Cavally, a river and town distant 10 miles from Gruway, a little town which lies 5 miles to the eastward of the cape. CAVALLY stands on the eastern bank of the river, off which there is anchorage in 18 or 20 fathoms, but the river itself is only navigable for boats. This place may be known by the two points of the river's mouth, which is wide and barred; though, in coming from the westward, you will not perceive the river till you are nearly to the S. E. of it. To the eastward of Cavally, as far as Growa, a distance of 12 miles, the land in general is even, but near the latter it appears double, and from thence to Tahou it rises considerably. Growa may be known by some rocks and breakers before it, and has a roadstead of 20 fathoms, good ground. Two leagues E. S. E. from it is Tabou, a low flat point, which appears beyond two hummocks on the beach, projecting into the sea, with breakers over it, two miles from which vessels may ride in 15 fathoms.

The land to the eastward, as we have observed, is much higher; but particularly as we approach within 5 or 6 leagues of Tahou, where it appears more elevated than any other part between it and Cape Mount. TAHOU is a town of some importance; there is good riding before it in 12 to 14 fathoms; but care must be observed not to approach the shore, which is rocky. The river St. Pedro lies half a league to the westward of Tahou; and 2½ leagues further, in the same direction, is BEREBY, to the southward of which is the Devil's rock, connected to the shore by a ledge on the west side.

ST. ANDREW'S BAY. Eleven leagues to the eastward of Tahou is the bay thus denominated, which may be distinguished by an elevated part of the coast to the westward, called the High Land of Drewin, a rocky shore, having rocks extending two miles into the sea. The western point of St. Andrew's Bay is named Swarton Corner, a bluff point, with two large round-topped trees, appearing about a league to the west above the land; with these trees bearing N. W. by W. you may anchor in 9 to 12 fathoms, fine sandy bottom, with three high hills appearing in one, 5 leagues inland. Behind Swarton Corner wood and water may be obtained, but for this accommodation a douceur or *dash* must be presented to the chief. St. Andrew's river is one of some magnitude, falling into the bay. To the eastward of St. Andrew's, the coast has a picturesque appearance, being lined with trees of various colours; it is in general low, and has a sandy beach. The river Frisco, or Lagos, is distant about 10 leagues, where water may be obtained, and ivory bartered for. Seven leagues to the eastward is the town of Kotrou, and 9 leagues further is that of Lahou.

LAHOU is the chief town on this coast, and carries on the chief barter in gold dust and teeth. It stands on the west side of the river, and affords safe riding, varying in depth from 8 to 10, 12, and 14 fathoms; the bottom on the east side of the cape being composed of clay, while that on the west side is mud, with the depths of water somewhat similar. Jack Lahou is nearly 5 leagues to the E. S. E. ¼ E. (East) from Cape Lahou; 6½ leagues further is that of Picaniny, or Little Bassam, situated to the northward of a tract of sea, which, from its unfathomable depth, is termed the Bottomless Pit.

Grand Bassam is distant 8½ leagues from the former, and stands on the eastern bank of the river Costa, which may be known by a cliff or rock on its western point. There is good anchorage here two miles off, in 12 to 9 fathoms, mud and clay bottom. Plenty of water and refreshments may be obtained here. The coast between Grand Bassam and the mouth of the Assinee river trends E. S. E. (E. ¼ S.) 6½ leagues. This was a place in former years of some trade, but the town is now abandoned. There is anchorage about a mile and a half from shore, in 10 to 12 fathoms, sand and clay.

THE GOLD COAST. Three leagues to the eastward of Assinee lies the small town of Albanee, between which there is anchorage in 13 or 14 fathoms, good ground. Tabo is situated two leagues further, in the same direction, on the west side of Gold River; but this part of the coast must be approached with great caution, as it is shoal at the distance of two leagues, and has a heavy surf setting on shore. From Tabo to the pitch of Cape Apollonia the coast trends S. E. (S. E. by E. ¾ E.) 4 leagues; the ground around the cape is in general foul, but there is good anchorage with the fort, which stands on the beach, bearing N. ½ W., and the cape N. N. W. ½ W. The landing is very bad, and it is dangerous to cross otherwise than in the canoes of the natives. The gold-dust of this place has been noted for its superior quality and quantity, and it, with ivory, may be purchased in barter, as at Cape Lahou. The distance from hence to Axim is 6 leagues, where there is a Dutch factory, called Fort St. Antony, two miles to the westward of which is the Seenna, Colra, or Snake river. The entrance of this river is small and rocky, and may be known by three black rocks, with breakers over them, lying half a mile from shore, to the eastward of the entrance. The ruins of another Dutch fort, named Brandenburg castle, lie 4 leagues south-eastward of Axim.

The coast from St. Andrew's bay to Cape Apollonia appears extremely low, but it then assumes an undulating appearance, and is thickly wooded.

Between Tabo and the cape are four remarkable eminences, standing along the shore, at equal distances from each other, and serve as a good mark for Cape Apollonia.

CAPE THREE POINTS is the centre one of three headlands, which project into the sea, and range in an east and west direction upwards of 3 leagues. The coast hereabout is high even land, but the shore is rocky, and should not be approached nearer than 2½ or 3 leagues, by which precaution you will avoid the current that sets strongly on the reefs. There is anchorage in 12 or 13 fathoms, about one league from Acquidah, a Dutch fort, standing on the easternmost projection of Cape Three Points. A bank of 9 and 10 fathoms lies about 5 leagues south of Acquidah, between which and the shore there is a strong current that sets to the eastward.

Dixcove is distant 4 leagues to the eastward of Acquidah, and affords abundant supplies of wood and water; gold is also here abundant. The fort is English, being of a quadrangular form, on a rising point; the anchorage is in 15 fathoms, clear oozy ground, with the easternmost point of Cape Three Points bearing W. ½ N., and the fort North, or N. by W., or even N. N. W. At Dixcove there is a small harbour formed by a reef of rocks, which affords a fine landing-place. The Dutch fort of Bautrey is 3 miles to the north-eastward of Dixcove; then follows Tacorady, another belonging to the same nation; and half a mile to the westward of Secondee is Fort Orange. *Secondee* is an inconsiderable place, which may be known by the British factory or fort, built on a reddish point of land, with a low sandy beach on each side. The coast hereabout is very rocky, and ought not to be approached in less than 16 fathoms during the night time. About a league to the southward of Tacorady is a reef, with breakers, having 4 fathoms near it.

About two leagues to the eastward of Secondee is the river St. John, or Boosempra, a short distance west of which is Chama, distinguished by the Dutch fort of St. Sebastian; and 9 miles further is Commenda, where two forts stand, one English, and the other Dutch. This place may be known by a small elevation on the left, named Gold hill. The anchorage is in 9 or 10 fathoms, sandy ground, with the English fort bearing N. W.

St. George del Mina, or Elmina, is the chief settlement of the Dutch on this coast, and is distant about 8 miles to the eastward of Commenda. The fort of St. George stands on a hill named Mount St. Jago, behind the fortress or castle on the beach. The anchorage in the roads is in 7 fathoms, sandy bottom, the fortress bearing north, two miles distant, with Mount St. Jago open a little to the westward. Cape Coast castle is distant 3 leagues E. by S. of Fort St. George.

CAPE COAST CASTLE. This is the principal British fort on the Gold coast; and as it lies low, and as some vessels have not readily been able to distinguish it, but have gone to leeward, and with much difficulty and loss of time have been able to get back, the following particulars will serve to obviate such mistakes in future. Cape Coast castle may therefore be known, first, by Phipps' tower, now called Fort William, surmounting a small conic hill of that name. This building is circular, having a barrack in the centre like a pent-house; secondly, another circular building, called Smith's tower, of which the fortified wall only is seen on a hill of red clay; and, thirdly, by McCarthy, or Hospital's battery, of an equilateral triangle, with a small citadel at the N. E. corner. Cape Coast castle presents a frontage of 180 yards towards the sea; but, as it has been observed, it lies low, and the distinguishing marks here noticed will be of utility, and serve to prevent its being mistaken for Annamaboe, hereafter described.

Cape Coast Light. On the 1st of October, 1835, a light was exhibited at Fort William, which burns at an elevation of 204 feet above the medium level of the sea, and at a distance from the beach of 760 yards. It is visible to vessels in every direction, whether approaching or sailing parallel to the line of coast. In steering for the anchorage, vessels ought to bring the light to bear N. ¾ W., keeping the lead going, and to anchor in 6 or 6½ fathoms water, the light being then distant from the vessel about two miles.

In ordinary weather, the light will be visible at the distance of about seven leagues, and will be of great service in preventing vessels being carried to leeward of their port, by the strong south-westerly current which runs off the coast, about 10 months in the year.

The anchorage in Cape Coast castle roads is in 7 or 8 fathoms, stiff mud, the castle flagstaff bearing N. N. W. 1½ mile, in a line with the hall of the castle and Smith's tower; Elmina castle W. by N., distant 3 leagues, and Annamaboe point E. by N. 10 miles.

Annamaboe. Having passed the Dutch fort of Nassau at Mauree, to the eastward of Cape Coast castle, you will have regular soundings of 8 or 9 fathoms, at a league distant from the shore, until you reach the English fort of Annamaboe. This is a small quadrangular building, standing low on the beach. Anchor before the town, in 7½ fathoms, with Fort Cormantine (next described) bearing E. N. E.; or perhaps a more preferable situation will be, with the flagstaff of the fort brought in one with the second of the Cormantine mountains, a chain of high land, seen to the eastward. Cormantine is a Dutch fort, standing on a hill, 5 miles to the eastward of Annamaboe, off which there is anchorage in 7 fathoms, the fort bearing N. W. or thereabout. The Dutch settlement of Apam, which was next eastward, is now abandoned. The British fort of Tantumquerry is distant 6 leagues from Cormantine, and 2 leagues from Apam. The fort stands a league to the north-eastward of a point of the same name, which is rendered foul by a reef that extends a mile from shore, and consequently must have a berth in approaching the anchorage off the fort, in 9 fathoms.

Winebah. About 2½ leagues to the eastward of Tantumquerry is a high conspicuous mountain, called the Devil's hill, near to which there is good anchorage in 8 to 10 fathoms, the hill bearing N. N. W. Winebah is distant about 1½ league from this anchorage, and was distinguished by a fort, which was destroyed and abandoned some years ago. From Winebah there is a communicating path to the commercial town of Kibbs, in the country of the gold mines; and on the east is a small river, the water of which is good, if filled at a proper distance from the sea. The natives require a small duty for watering. The small fort of Barracoe, now deserted, stands on the side of a woody hill, about 3 leagues eastward of Winebah, and may be known by a double hill 3 leagues inland, called the Paps.

Accra. This place is distinguished by three forts, named St. James, Creverour, and Christiansburg, belonging respectively to the English, Dutch, and Danish. The little river Sacoom is 6½ leagues to the eastward of Barracoe, having on its eastern side a little round hill, called Cook's Loaf, with some high mountains beyond it, named the Tafou mountains, from whence to Accra, distant about 2 leagues, the land is even and moderately high. The best anchorage at Accra is in 6 or 7 fathoms sandy bottom, distant two miles from the shore, with the English flagstaff bearing N. by W. ½ W., or having brought the red spots seen on the beach, to bear North, you may anchor in 7 fathoms, but the other is to be preferred. The surf on the beach here beats frequently very high, and occasions much difficulty in landing. Accra is a place of considerable trade in gold and ivory. During the springs the tide rises 8 feet; the currents set in general to the eastward, except about the midddle of January, during the Harmattan season.

Vessels bound from Cape Coast castle to Accra, and leaving the former, during the night, are recommended not to run more than two-thirds their distance, as if they happen to get to leeward, it will be difficult to work back, against a sea and strong current.

The inconsiderable settlement of the Danes at Temma, lies between Accra and that belonging to the English at Prampran; two leagues from the latter is the Danish fort of Ningo, the coast between affording good anchorage in 6 to 9 fathoms, gravel and sand. Ningo Grande is a high sugar loaf hill, the highest of the range called Crabo, which lie about eight leagues inland.

THE RIVER VOLTA. The coast to the eastward of Ningo as far as the river Volta, a distance of 7 leagues, is extremely low, being little above the level of the sea, so that vessels coming from the westward, do not discern the river until it bears N. N. W., when the island within the entrance may be distinguished; there are regular soundings along the shore, and when abreast of the river the water changes suddenly to a dark olive colour. The Danish fort of Adda castle stands on the western bank, 11 miles from the entrance. The Volta takes its name from the rapidity of its stream, and pours such a quantity of water into the sea as to cause the discolouration already stated. There are high breakers at the mouth of the river, which is only a mile wide, having two bluff points, that on the west called Sandy Bluff, that on the east Woody Bluff. In entering the river, run in from the east side within the breaking; there is anchorage in 7 fathoms, with the entrance of the river bearing N. N. W., a soft muddy flat, cast off by the stream, extending 3 leagues into the sea, having 6 to 9 fathoms water.

REMARKS UPON THE APPEARANCE OF THE LAND ON THE GOLD COAST. *From the Dutch fort of Bautrey to Cape St. Paul, the ship standing along within 5 and 6 miles of the shore. By* CAPTAIN R. WAUCHOPE, R. N., H. M. S. THALIA. *Taken from the Nautical Magazine for* 1835, *page* 644. "To the eastward of Fort Bautrey, the fort of Secondee is seen. Its appearance from the sea is that of considerable strength; it stands close to the water, built upon a bank of horizontally stratified sand-stone, of a reddish colour, surrounded on all sides, except that of the sea, by thick wood. A sandy narrow beach stretches to the east and west of it. The bare rock again appears at the termination of the beach to the eastward, and is seen in several places within 8 or 10 miles from the fort, in this direction, and then a densely wooded coast.

"The next fort is the Dutch fort of St. Sabastian, at Chama, or Assina. This is a large white fort, surrounded by natives' huts, having a long narrow strip of white sandy beach to the west of it; the beach is broken to the eastward for above three miles, by the wood extending to the water's edge, when again a long narrow beach continues for 8 or 10 miles, and the red cliff is seen bare of vegetation in several places. The land not high, but entirely covered with low wood. The next fort is that of the British fort of Commenda, or rather the two forts. They may be seen at the same time with Chama. One of the forts, of a dark grey stone, a square building, seemed to be in tolerable repair; the other, about a mile to the eastward, was a complete ruin. A number of native huts were near the forts, and a greater number of canoes were hauled up on the beach.

"From thence to the eastward the two large and magnificent looking forts (Dutch) of St. George del Mina make their appearance, as if newly white-washed, and are of a dazzling white. On approaching them, we observed, about half a mile apart, two other small forts, the one to the westward being round, and the other square. The western large fort is situated upon a rising rocky ground, about 70 feet above the level of the sea. The east large fort stands on the beach, in the middle of a considerble sized village. Some of the houses are of stone, but chiefly miserable looking huts. To the eastward of Del Mina, the same low undulating wooded line of coast stretched along with a narrow strip of sandy beach.

"Soon after Del Mina is clearly made out, the round white-washed tower (Phipp's tower) of Cape Coast castle is seen rising magnificently from the sea; it is built upon rising ground, to the rear of the castle, and is the first object which is seen. On approaching, the handsome and extensive castle of Cape Coast is clearly seen; and, on landing, the interior does not disappoint expectation, as the whole of the buildings are in admirable repair. A few miles to the eastward of Cape Coast castle, the ruined English fort of Morees is seen. The mud huts of the natives still surround the square brown ruin. Still further to the eastward, the small English white-washed fort of Annamaboe is seen. The appearance of the coast is similar to what we have already passed, viz., a narrow sandy beach, rocky in some places, and low undulating hills, covered with low underwood, behind.

"A few miles to the eastward is the ruined square brown Dutch fort of Cormantine, situated on a pretty rocky green hill, close to the sea. The natives' huts extend to the westward of the fort, and to the eastward the same description of coast as that above mentioned. At 5 leagues to the eastward of Cormantine, Tantumquerry point is seen; it is low and rocky. There is a reef of rocks lying about a mile to the N. E., on which the sea was breaking when we passed it. On first seeing the point, one fort only is observed; on approaching, another square brown fort, nearly joining the former, is seen, and the low land becomes visible beyond the Devil's hill, which is the highest hill on the coast between Cape Three Points and Accra. When abreast of Tantumquerry point, the fort of Apam is seen to the left of Devil's hill,—a brown ruin of considerable size. A large native village surrounds it, except to seaward. Along this whole line of coast (for we have run it down within from 4 to 6 miles) there are native villages to be seen at intervals, consisting of thatched mud huts.

"The next fort is the English fort of Winebah, now in ruins. When abreast of this, you can just see Tantumquerry point, and the fort to the westward, and Barracoa point to the eastward. Winebah stands upon a low line of hills, having nothing particular to mark it, except a white-washed thatched house of considerable size on the beach, and the ruins of a fort a little to the left. There is high land in the distance. The next point is Barracoa point, with a very remarkable palm tree upon it; and to the eastward of it, considerably higher than the low land, the peculiarly-shaped double hill, called the Paps, is seen in the distance: this and the palm tree point out its situation very distinctly. On nearing the point, the fort, and flagstaff, and native village are seen, and the distant coast beyond, terminating in a very low point. On rounding Barracoa point, the Paps are much more distinctly seen, being much nearer; and the remarkable hill called Cook's loaf, a conspicuous round hill, is seen close to the sea.

"The land to the west of Cook's loaf appears very low, and to run out to a very low point, having still the same narrow strip of sandy beach; and on the point the three white forts of Accra are seen, and a fourth, the Danish, three miles to the eastward. The English and Dutch are within a mile of each other, so that the coast about Accra is particularly well marked.

"We sailed from this on the 17th November, and on the 18th hauled in for the land, and found ourselves in the morning abreast of Ningo, a Danish fort. It is a good looking white-washed fort, apparently in good repair, about 7 miles off shore. The water shoals to 7 and 6 fathoms; a little further out, 12, 13, and 14 fathoms; and all the land seen to the eastward appears very low indeed.

"The marks for Ningo are some hillocks to the eastward, and the high conical mountain of Ningo Grande inland; the hillocks I could not make out clearly; when abreast of Ningo a small white fort is seen to the westward, which is, I suppose, the English fort of Prampram. There is the same narrow line of sandy beach, as we have observed all along, to the westward of Prampram still. Another white-washed house, or fort, may be seen when abreast of Ningo. To the eastward, the tops of trees are only to be seen, the land being so low. Six and seven miles from the shore, the soundings along the coast are 11 to 13 and 14 fathoms, coarse sand, and in some places rocky bottom.

"A great quantity of sea-weed was seen to the eastward of Ningo, the first we met with on the coast. Abeam of us, about 1. P. M., some miles to the eastward of Ningo, observed a flagstaff, and two large thatched houses; a number of naked negroes; and on the beach was a good deal of surf. The wood on the coast here consists chiefly of a peculiar kind of palm, the stem similar to the cocoa-nut tree, but the upper part more bushy, and similar in appearance to the silver tree at the cape.

"At 3 P. M., 18th November, saw the mouth of the river Volta, bearing N. N. W. It is on this bearing alone upon which it can be seen. The two bluff heads at the entrance appear very bold, and make the mouth of the river very obvious. In standing along to the eastward, the entrance was not seen above five minutes, as it was soon shut in by the eastern bluff.

"The whole coast to the eastward of the Volta to Cape St. Paul, is very low; nothing but trees are seen. In 9½ fathoms off the cape, this is its appearance; nor could the cape itself be made out, except from the trending away of the land to the northward."

BIGHT OF BENIN.

CAPE ST. PAUL is 5 leagues distant from the Rio Volta. Hereabout the land is low, and cannot be seen at more than 3 or 4 leagues off; the point is thickly wooded, the current setting strongly round it. About a league to the westward of it is the entrance to the river Secos, or Dry river. Cape St. Paul, as well as the whole coast of the Bight of Benin, to Cape Formosa, its eastern extremity, is extremely low, so that one point is with much difficulty distinguished from another. About 4½ leagues N. E. of Cape St. Paul is the Danish fort of QUITTA. From thence to Acquijah is 3 leagues; and from the latter to Paurey, the distance is about the same. Gugligou lies 4 leagues to the eastward, and may be recognised by four hills lying a league to the eastward.

LITTLE POPOE is about 3 leagues from these elevated spots, which are the only eminences hereabout. The town stands on a small river of the same name, southward of which there is anchorage in 9 or 10 fathoms, coarse white sand. In the bight from Quitta to Little Popoe, 8 to 14 fathoms will be found 4 leagues from shore. GREAT POPOE is distant 7½ leagues to the eastward, and is distinguished by three factories, belonging to the English, Dutch, and Portuguese. WHYDAH stands 4½ leagues

E. by S. from Popoe, the coast between which is low and swampy, and in some parts wooded. Of the latter you will perceive a remarkably high tree, appearing like a tower, about 1½ league to the eastward of Popoe; and a league from this object is a conspicuous elevation, called Mount Palaver; from hence to two round-topped trees, called the Brothers, the distance is a league; and these will serve to point out Whydah road, which is 3 miles to the eastward. The anchorage is in 8 fathoms, muddy bottom, the two Brothers bearing N. N. E., and the town of Whydah N. by E. GRIWHEE stands on a lagoon or lake within Whydah, which runs parallel with the beach, and communicates with the sea at Popoe. The coast being low, and no object to intercept the view, in sailing to the eastward from Popoe, Griwhee may be seen with a telescope, when you are in 8 fathoms, distant a league from the shore.

The next town to the eastward of Whydah is Jackin; after that follows Appee, where formerly an English factory was established; the next is Porto Novo, distant 3 leagues from Appee, and 10 leagues to the eastward of Whydah. Vessels anchor before the town of Porto Novo, in 7 or 8 fathoms, black clay, with shells. Porto Novo is the port of ARDRAH, the capital, which is distant 8 leagues to the northward. The roadstead of BADAGRY is in 6 or 7 fathoms, and is tolerably good; it lies 4 leagues from Porto Novo, the town of that name being situated a league ftom the beach, on the north bank of the lake or river that runs from Ardrah into Lagos river, which is here 600 feet wide.

RIVER LAGOS. From Badagry to the entrance of the river Lagos, the coast is very low and marshy. It is bordered all along with palm trees, and the landing is rendered dangerous by the high surf. Besides, it is much subject to heavy rains and tornadoes: these may be foreseen, by the great thunder and lightning, with the rising of black clouds, which commonly precede them; then it is best to hand all your sails, except your foresail, whcih you may keep in the brails, to command your ship, and run before the wind during the tornado, for what you get is to windward.

The entrance to the river Lagos, though half a mile broad, is reduced to little more than half that breadth, by the banks that project on each side. On the west is a small river, where wood and water are obtainable. Lagos island, within the entrance, is 5 miles long, and 1½ in its greatest breadth; at its north end is the town of Lagos, having good anchorage before it. About 4 miles to the eastward of the entrance, or the English road, lies the French road and the watering-place. Cradoo Lake extends 15 leagues from west to east, its greatest breadth not being above two leagues; the town of Cradoo stands on the north shore, about 3 leagues from its eastern extremity. Between Badagry and Lagos river numerous huts are scattered along the beach, in the midst of pretty groves of cocoa-nut trees. The mouth of the river Lagos is so contracted that it may easily be passed unobserved, and probably would be were it not for the breakers at the entrance. Ten leagues to the eastward of Lagos is the small town of Palma, and 9 leagues further, in the same direction, is Oddy: the coast from hence, for 8 leagues, trends to the eastward, where it takes S. by E. ½ E. direction (S. E. ¾ S.) 3 leagues, to a small fishing town interspersed with several lofty trees; from this small town the coast trends, in the same direction, 7 leagues to the river Benin, or Formosa river.

The following perhaps may not be considered as misplaced: Dalzel says, "From Sherbro to Rio Formosa, or river Benin, (which is the part of Africa with which Europeans are best acquainted) a tract of 1400 miles of sea coast, there is not one navigable river, bay, or harbour into which a ship can enter; nor is there one river or creek (the Volta and Lagos excepted) into which a sailing-boat can advance 10 miles from the sea; very few of the creeks will even admit a boat, and not one on the Gold coast, except at Chama and Elmina; a small boat may row up the former about two miles, and up the latter about a quarter of a mile.

The shores are, almost in every part, difficult of access, from the heavy surf which breaks upon the beach; it is scarcely possible to land anywhere but in a light canoe, and even in that way it is frequently impracticable for many days together; in many parts, besides, there is, near the shore, scarcely water enough for a canoe, and the breaking of the waves becomes there so impetuous, that all communication between the shore and the shipping is frequently interrupted for three weeks together, and can seldom be effected with safety.

THE RIVER BENIN, OR GREAT FORMOSA RIVER, appears like a green low bushy strand, in front of a thick row of trees of regular and moderate height; in the vicinity of the river the usual depths vary from 4½ to 5 fathoms, at two leagues from shore, but off the mouth it is not quite so deep. The course from Lagos to Benin river is S. E. (S. E. by E. ¾ E.) 32 leagues; but it is advisable for strangers to keep in the parallel of 6° N., and having made the land near the small fishing town already noticed, coast along shore to the entrance; the water before which is generally of a dark green colour, and more shallow than on any other part of the coast.

The RIVER BENIN is about two miles wide at the entrance, having a bar of mud, clay, and sand, that extends a league into the sea, on which are only 2 fathoms spring tides, and it is therefore not fit for vessels drawing more than 9 or 10 feet. At a few miles from the sea this river is only half a mile wide; and at New Town, which is 6 leagues up, little more than 400 or 500 yards. Two branches near New Town, called Gato creek, and Waree creek, are nearly equal in magnitude to the main trunk; one, running to the N. E., communicates with Gato, and the other with the river Waree, or Forcados. The direction of the main trunk is about E. N. E.; and, according to the report of the natives, at about 50 miles up, it is not navigable for vessels of 50 tons. The depth of water in any part does not exceed 4 fathoms.

The kingdom of WAREE is situated to the south of Benin river. Its first town lies near the bar, and is called Salt Town; the second is named Bobee, or Lobou; and the third, which is the sea-port of the capital, is called New Town; the last is opposite Reggio town and point, on the east side of the entrance of Gato creek. Both shores of the main branch, as well as the creeks, as far as Gato on one side, and Waree on the other (with the exception of a few spots) consist of impenetrable morasses covered with mangrove trees, and generally inundated, even during the dry season, as the banks are very low. Formerly several European nations, as the Portuguese, Dutch, English, and French had establishments on this river, chiefly at Gato; but trade has so much decreased, that they have been all abandoned, and merchant vessels, now trading here, merely hire a house for bartering in as long as may be necessary. The slave-trade, which is carried on to a great extent in all the rivers of this coast, appears to be the cause of the decline of legitimate commerce. This river, like all the others on the coast, is pestilentially unhealthy, and the mortality that invariably occurs in the crews of vessels trading here, is appalling; the disease is a malignant remitting fever, which generally proves fatal within the third day after the attack. The chief articles procured in this river are palm oil and ivory; pod-pepper (cayenne) was also an object of commerce, but is now more plentifully procured from the West Indies. In exchange the natives take cloth (scarlet particularly) beads, guns, and gunpowder, hardware, spirits, &c. The best season for traders to the Benin river is between the month of September and the latter end of February, during which period there are clear refreshing breezes, with fine weather, and land-winds favourable for going out; but, beyond the month of February, as the weather changes, getting out is attended with difficulty and danger. Here the tide flows 6 hours, at full and change, and rises 5 or 6 feet during the rainy season; the ebb is very rapid, and frequently washes away portions of the river banks.

The BEST ANCHORAGE without the bar is in 4½ fathoms, heavy mud and clay, distant 4 or 5 miles, with the river well open, and the N. W. head bearing N. E.. In ENTERING, stand toward Salt Town within a league, until the N. W. head bears N. E. by N. (nearly N. by E.) then steer N. E. by E. about two leagues toward the larboard shore, as you thus avoid the Lobou bank, which lies on the opposite side, and which reaches more than half-way over. Having advanced, Jo point, which is covered with trees, will be seen on the starboard side. By steering for the middle of the river, off this point, you may there drop anchor in 4 fathoms, having a creek with an islet at the mouth to the northward. This creek is called Waccow creek, and comes down from Waccow's town, which is 5 miles up, from Benin river. The anchorage here is best for vessels intending to stay any time in the river, being open to the sea breezes, with a free draught through the roads, and in a centrical situation for trading purposes. Within Jo point is Calabar creek; at 5 miles higher, on the opposite side, is another inlet, called Lago creek, having an islet on each side of its entrance, surrounded by a mud-bank: the latter will be avoided by keeping over to the starboard shore, until you are off the large opening, called Gato creek, where you may anchor abreast the town of Reggio on the north, and New Town on the south, in 3½ and 4 fathoms.

The RIVER ESCRAVOS is distant 4½ leagues, S. by E. ¼ E. (S. E. by S.) from that of Benin, and has not more than 2 fathoms at the entrance; a bank also extends some considerable distance from its south point. The land from hence winds to the eastward, 5 leagues to the RIVER DOS FORCADOR, or Waree. The entrance to this river may be known by an island in the centre, and another named Paloma, near the shore on the south side; the entrance is shoal, having but 2 fathoms water, and a flat extends from the S. E., but without, there is anchorage in 7 fathoms. A league within the river is the town of Paloma: the city of WAREE is distant from this town 5 leagues, in a N. E. direction. The RIVER RAMOS is not a stream of much importance; its entrance is distant 17 miles S. ½ W. (S. by E. ¼ E.) from the river Forcados, and is scarcely a quarter of a mile broad. The RIVER DODO, another inconsiderable stream, is 20 miles S. ¼ W. (S. by E. ½ E.); and about 7 leagues S. by E. ½ E. (S. E. ¾ S.) from the latter is Cape Formosa.

CAPE FORMOSA, and the land around it, is so low, that it is not easily recognised, and soundings of 14 or 15 fathoms may be obtained ere you are aware that land is near. Within this depth, the first objects to be distinguished are the trees, which at first seem to grow in the water, and intimate your approach to shore, at between 2 or 3 leagues from which you will have 8 fathoms water; but we would recommend vessels not to get nearer, as at this distance they are without the influence of the current, which in July and August sets strong to the eastward. All the coast from the Benin river to Cape Formosa, a distance of nearly 40 leagues, is low, swampy, and unhealthy, and is thinly inhabited, and but little frequented.

BIGHT OF BIAFRA is the innermost part of the Gulf of Guinea; it is bounded on the north by Cape Formosa, and on the south by Cape Lopez. Cape Formosa divides it from the Bight of Benin. A straight line, uniting both promontories, and passing near Prince's island, would measure about 580 miles, and would be upwards of 250 miles from the mouth of the Old Calabar river, which enters the innermost corner of the bight. The shores of the bay probably extend to more than 800 miles.

The Current prevailing in this bay does not appear to be in any way connected with the equatorial current of the Atlantic Ocean, which commences near the island of Anno Bom, but to be a continuation of that current which comes up from the Cape of Good Hope, along the western shores of Africa, for Captain Boteler says, that all the currents along Prince's island set strong, and in the dry season commonly between N. N. W. and N. N. E. The wind generally blows from the S. W. or South. The current, however, is changed by the tornadoes, whenever they occur at full or change; at which time, blowing from the S. E. or N. E. with great violence, they alter the direction of the current to W. S. W. or W. N. W.

The Quorra River, or Niger, whose principal branch, the *Nun*, empties itself into the sea near Cape Formosa, is the first of six rivers which intersect the coast between the land of Formosa and the New Calabar river. The Nun is the only one of the number that is accessible, and this is rendered difficult by a shoal and small rock, half a league from the mouth, on which the sea breaks; the water is muddy off the entrance, as far as 7 fathoms water. The second is that of St. John, or Bento, and is distant about 11 miles from the former. The third is called St. Nicholas, and opens when it bears N. N. W.: it is 11 miles from the river Bento. The fourth, or St. Barbara, is 11 miles E. ½ S. (E. N. E. ¾ E.) from that of St. Nicholas; the entrance is wide, but does not open until it bears N. N. E. The fifth, or St Bartholomew, is 7½ miles to the eastward, and has shoal ground extending from the entrance to the distance of 4 miles, without which are 3 or 4 fathoms. The river Sombreiro, or sixth river, lies 10½ miles to the eastward, and is the last of the six which lies between New Calabar and Cape Formosa; it opens when bearing N. by W., and makes with a large tapering bluff on the west side. The coast between Cape Formosa and the Calabar is thickly covered with mangrove; it has a sandy beach, without which are 6 and 7 fathoms, bottom of stiff mud and clay; a strong current generally sets to the eastward.

Vessels bound to New Calabar, or Bonny rivers, are advised to make the sixth, or Sombreiro river, which opens when it bears N. N. W., in order to ascertain their situation. Between it and the western extremity of Calabar, called Foche point, there is a bank of hard sand extending from the shore, nearly two leagues, as far to the eastward as Foche point, where it is bordered by a line of breakers; the sea occasionally breaks on the western extremity also, but it may be passed in 5 or 6 fathoms. From off the river Nun, or Quorra, the course to Foche point is E. S. E. ½ E., 20 leagues, running along in about 8 fathoms, muddy bottom, distant between 3 or 4 leagues from land. It is better not to run further on this coast than the sight of land ahead in the evening, but come to anchor, lest you be set to leeward. After leaving Sombreiro river, the shoal, already noticed, will oblige you to haul off a point or two, but with daylight, Foche point will be seen before you get that length.

New Calabar and Bonny Rivers. Rough corner is the eastern extremity of New Calabar and Bonny rivers. There is a channel on each side into the respective rivers, but the middle part is occupied by a large bank extending out to sea, and on several parts of which are only 3 feet of water, with one or two islets, and several spots nearly dry at low water. From Foche point to the eastern point of the entrance of the Calabar, the river is two miles wide; but lower down, between Foche point and the middle bank, or Calabar flat, is little more than a mile. The bar is formed by a spit of sand, extending to the S. E. from Foche point; its inner part dries, but without this are 10 or 15 feet water. There are several shoals in the channel without the bar, on the west side; the mark for which is, Foche point bearing N. E. $\frac{3}{4}$ N., and with these bearings the channel may be entered, by giving the shoals a proper berth.

Bonny River. The best anchorage off Bonny river is with Foche point bearing N. $\frac{1}{4}$ W. about 8 miles, and Rough corner N. E. $\frac{1}{4}$ E. the same distance; or Jewjew point, a low point a mile within the latter, a little open to the left of it. The anchorage here is strong holding ground, and you will be near the fair-way of the entrance without the banks in 4$\frac{1}{2}$ fathoms, within a mile from the bar; the latter extends S. by E. from the great middle ground or flats, its outer extremity bearing S. W. 7$\frac{1}{2}$ miles from Rough corner. The Baleur Bank lies to the eastward of the bar, and extends 4 miles S. E. and N. W.; the channel between it and the bar is a mile in breadth; the middle and eastern patches lie to the eastward; and between these and the Bonny flats, which extend from shore, and are steep-to, lies the eastern or Portuguese channel into the river. The Portuguese bank lies to the eastward of the patches. The town of Bonny stands on the western side of a creek, 3 miles from Jewjew point. On the opposite side is the point and town of Peter Fortis, below which is a bank dry at low water.

You will enter the river over the tail of the bar, by bringing Peter Fortis point well open of Jewjew point. This will enable you to clear the west end of Baleur bank in 3$\frac{1}{2}$ fathoms; but take care that the flood through the Portuguese channel will not drive you towards the Calabar flats, which are steep-to. Having passed the Baleur bank, steer N. E. $\frac{1}{2}$ N., keeping Rough corner open on the starboard bow; the water then increases from 7 to 12 and 16 fathoms, as you approach the Bonny flats, the spit of which is half a league W. S. W. from Rough corner; as you advance to Jewjew point, the soundings gradually decrease from 15 to 10 and 9 fathoms. Keeping the starboard shore on board, you will then reach Bonny, and anchor opposite a sandy point, with houses on it, at the entrance of the creek leading to the town, distant 4 miles from Rough corner. During the day-time, a vessel may enter Bonny at any time of the tide, with wind and clear weather; keep a steady look-out, and the western breakers will direct you.

Although the mouth of the Bonny is surrounded by shoals, and there are two dangerous bars to pass, yet, when once in the river, nothing can be finer; the water deepens to about 10 fathoms, and, for the first 7 or 8 miles, the breadth is about 4, when it receives a large tributary stream, which vessels, not drawing more than 13 or 14 feet, can ascend for some miles. Vessels trading for palm-oil lie two miles below this stream. The river ought never to be attempted without good pilots.

Captain Midgley says, "The estuary of the New Calabar and Bonny rivers is 7 or 8 miles wide, between Foche point and Rough corner. Having made the Rio Sombreiro, or sixth river, which is open when bearing N. N. W., Foche point will be seen further to the eastward, and will appear from the deck to be the extremity of the land in sight. Foche point will appear rather bluff; and on advancing to the eastward, when the point bears N. E., two ragged trees upon it have a great resemblance to a topsail schooner at anchor behind the point.

"If bound to New Calabar, anchor in $5\frac{1}{4}$ fathoms water, with Foche point bearing N. E, and send a boat for a pilot. The pilots' town is at Foche, upon the banks of a creek, in within a cable's length up the river from the point. Whoever has charge of a boat going into this river, should be extremely cautious, as, owing to the breakers, the point cannot be approached within more than half a league, until the boat has rounded the point-breakers, and entered the river so far, that the coast to the westward will be shut up behind the point. Hence, upward, they may run the boat upon the bold sandy beach in safety, as there is not the least fear of being molested by the natives; however, if they can find an opportunity, when unseen, they will pilfer every article that is not too hot or too heavy to carry away.

"Between the Rio Sombreiro and Foche point there is a kind of gap, or indent in the land, which is very remarkable, as the land elsewhere in the neighbourhood is uniformly level, or very nearly so.

"If bound to Bonny, when Foche point bears N. E., haul rather more to the S. E. into 6 fathoms of water, (to avoid the west end of the Breaker island flats) and be careful, by hauling to the southward, not to get into less water, especially upon a flood tide. As the vessel advances to the eastward, she will gradually raise Rough corner (a low and level elbow land) upon the larboard bow; and at this time, Breaker island, which is very low and sandy, with one small solitary patch of brush upon it, lies at the mouth of the two rivers, will be seen from the mast-head, like a dry sand-bank. Keep the vessel in 6 fathoms water, and anchor when Foche point bears North. This anchorage is about one mile further out than the position generally adopted, but it has not only the advantage of clearer ground, and consequently better anchorage, but it gives more time upon a flood tide to get sail upon the vessel.

"Bonny bar has long been notorious for the great number of anchors lost upon it, and in its vicinity; the cause of which is the heavy short sea that invariably gets up after a change of wind, or a moderately heavy squall. All vessels trading to the Oil rivers of Africa, should have the windlass and bits well secured, and good anchors and cables, as they sometimes ride exceedingly heavy, and in very exposed anchorages. A boat must be sent into Jewjew town, at the entrance of Bonny river, for a pilot, if one be required.

SEASONS. "The seasons here appear to have been imperfectly described. The rains generally commence in the latter end of May, or early in June, and gradually increase, with strong S. S. W. and S. W. breezes, during the months of July, August, and great part of September, toward the end of which month they as gradually terminate. In July and August, heavy squalls frequently prevail; and in these months the wind very rarely shifts more than between S. S. W. and S. W., and the rain is incessant from sunset to nearly noon next day, when it ceases for a few hours, and again commences with more or less violence in the evening. In October the weather becomes more settled, with light land-winds, and occasionally showers of rain, which, however, yield to the moderate sea-breeze that sets in about 10 or 11 *a.m.* In November the tornadoes commence, and are at first violent, gradually decreasing in strength, as the *Harmattan* or *dry season* commences, although they are occasionally prevalent from this month to May. In December, January, and February, is the Harmattan season; and in these months the sea-breeze sets in about noon, and blows with very moderate force from the W. S. W. and Westward until sunset, when it dies away to a calm. During the night there is little or no wind, and the weather is extremely sultry and oppressive, with very heavy unwholesome dews.

"After daylight a light air springs up from the Northward or N. N. E., which gradually increases to a moderate force, and continues until about 11 *a. m.*, when it falls calm, and soon after is succeeded by the light westerly breeze. The Harmattan, however, sometimes blows steadily and without intermission, from the N. E. quarter, for several days together, especially about the new and full moon. It is at this season that the *smokes* prevail, and are exceedingly injurious to the European constitution. These smokes are so dense, that it is impossible to see a cable's length from the ship for days together; and any vessels that may be in the offing, inward bound, have no resource but to anchor, and wait with patience for clearer weather. In March, April, and May, the weather is clear, with light land-winds at day-break, which gradually die away, and are succeeded by the W. S. W. breeze, about 10 *a. m.*, and this breeze blows with moderate force during the remainder of the day, and greater part of the night. In these months the atmosphere is serene and clear, particularly during the nights, which are very fine indeed. The palm-oil season commences in the early part of March; the oil becomes plentiful in April, and continues to be so until September, when it declines; and from October to March it is, properly speaking, out of season, although small quantities of it may be procured in these months."

OLD CALABAR RIVER. The coast to the eastward of Bonny river to the Calabar is low, and covered with trees; it is bordered with sand, and has not any particular mark to distinguish it. Five leagues E. by S. (E. ¾ N.) from Bonny is Andony river, rendered unnavigable by a hard sand-bank, with breakers at the entrance. Twenty leagues E. ¾ S. (E. by N.) from Andony is the western extremity of the entrance of Old Calabar river, called Tom Shot's point; from which to Backasey or East head, opposite, the breadth is 10 miles. A shoal extends from Tom Shot's point to the S. S. W., 10 miles, and is nearly dry at low water in several places, with heavy breakers, which may be heard and seen at a considerable distance; there are also several shoals in the middle of the entrance, and a broad shelf extends 4 miles to the southward of the Backasey land, and encumbers the eastern side of the river for 6 leagues within the entrance. The East head is high and steep, with a break in it, called Backasey gap.

From off Bonny river the course to the entrance of Old Calabar river is E. ¾ S., in 10 fathoms, soft oozy ground. As you draw towards the river, the depths decrease to 7, 6, and 5 fathoms, hard ground; the East head then becomes visible, bearing E. N. E.; and having stood on to the eastward, until it bears N. N. E., the ground will be found soft, the haul-in North, bordering on the hard ground, when you will soon descry Parrot island. Having discerned Parrot island, you should keep away in 4 fathoms, soft ground, towards the mouth of Qua river, on the starboard side, when you will deepen your water to 5 and 6 fathoms. Tobacco point is a head of land to the northward of Parrot island, which, by keeping open, you will run in about 2¾ or 3 fathoms, within two miles of the island. Having steered about half-way up Parrot island, you should stand towards James island, which you will perceive on the starboard side; and as you proceed for the latter, you will have 2½ or 3 fathoms, gradually increasing to 4 or 5 as you go on. Keep the points of James and Parrot islands open about a sail's breadth, until you arrive at Seven Fathoms point, and then stand to the eastward, until the shipping before the town come in sight. From Seven Fathoms point keep across the river to the lower part of the tall trees, and stand close to them, till you are abreast of Henshaw's town, when you may cross to the place of anchorage. The town of Henshaw stands below Duke's Town, the latter being the place of trade, and off which vessels are moored; it is distant about 24 leagues from the sea, on the S. E. bank of the river.

At the entrance of the river it is high water, on full and change, at 6 H., and the vertical rise is 6 feet. The breakers here, on the western side, are heard and seen at a considerable distance; the rocks are large, and some above water; they must have a good berth. If you arrive here late in the evening, or with ebb-tide, come to an anchor; but with favourable time and tide, you may enter, by attending to the preceding directions. As the Backasey shore is mud, and the breakers' side sand, on shoaling your water with soft bottom, you edge over to the westward, and with sandy bottom, on the contrary, to the eastward; and thus, by the lead, you may venture as high as Qua river, in thick weather. From this place you enter between the banks of the Fish Town shore, on the starboard, and Parrot island bank, on the larboard side. The latter now forms a hook to the northward, between which and Parrot island many vessels, beating down, have been entrapped,—and this must, of course, be cautiously avoided. It may be further necessary to observe, that the ebb-tide sets with great rapidity, from the rivers on the eastern side, over the western breakers, and for which vessels bound outward should make proper allowance. When you are out, stand to the S. E., particularly with a light wind, to prevent the possibility of drifting on the breakers on the western side.

Seasons. The spring commences about November, and the hot months of summer continue until May, during which period the weather is clear and fine, but excessively hot, with occasional tornadoes. From the middle of June, the rains gradually increase, and continue in all July and August, descending, during the latter, in torrents. This period may be considered as the winter, and, during it, the inhabitants are afflicted with colds, fluxes, fevers, &c. In September, October, and November, the country is entirely enveloped in exhalations, which the natives term the *smokes*, and which are exceedingly injurious to the European constitution. In this season, fumigations of tobacco through the vessel, with smoking, have been found efficacious in repelling the pernicious effects of the vapour. It is advisable, for those who intend to remain for a season in the river, to have a housing over the vessel, in order to preserve the health of the crew, as well as the ship's decks and sides, which will otherwise be materially damaged, by exposure to the sun, during so long a period.

Current. Captain Midgley says, "That the mariner should be on his guard against the effect of the strong easterly current that runs from Terra Formosa to Old Calabar. This current runs with greater or less velocity almost throughout the year, except in or about the Harmattan season, when it occasionally sets to the Westward and W. S. W. Vessels that have advanced much to the eastward of Terra Formosa, and cannot see Foche point before night, should anchor, in order to prevent the effect of the current; but in squally weather, or the wet season, it may be as well to work to windward, heaving-to occasionally during the night, according to circumstances. Nine or ten fathoms is quite close enough to stand in shore in the night; when in 6 fathoms, the surf can be very distinctly heard. When once to leeward on this coast, getting up to windward again is attended with much trouble and difficulty.

"I may here remark, that too much attention cannot be paid to the lead, upon any part of the coast of Africa, as the current frequently sets directly in upon the land; and from careful observation, upon the windward coast, I can confidently assert, that the thermometer is no guide whatever on approaching the land. In more than one hundred experiments upon the surface water, I could never detect any sensible difference in the temperature when sailing toward the land from no bottom into 45 and 40, and thence close in shore into 14 or 15 fathoms on the Krou coast. In the dry season there is little difference hereabout in the temperature of the air and water; the former averaging 77° to 81° (in the shade) and the latter 74° or 75° of Fahrenheit.

"The HOMEWARD PASSAGE, through the Bight of Biafra, presents no particular feature to the attention of the navigator, if I may except the strong N. E. currents that almost invariably prevail in it. All homeward bound vessels, that do not intend calling at Fernando Po, should use every possible exertion to pass to the westward of the island, as a good board may be then made to the southward on the starboard tack. Except in the Harmattan or Tornado seasons, no advantage can be derived by standing close in shore, as there are no land winds, and a near approach is, at any time, very dangerous, as the whole of the coast from Camaroens to the Gaboon (except about Corisco) is generally bold-to, and the soundings in no wise to be depended on. Many navigators have remarked, that on standing to the westward between Princes and St. Thomas's, even when making a trifle of northing, the N. E. current has been found to diminish in strength as the vessel makes westing. Even so far to the southward as 3° South there is seldom any easting in the wind before passing the meridian of Greenwich.

"Vessels bound to the northward should not attempt crossing the equator to the eastward of 20° W. (the meridian of 21½° W. is to be preferred) and should then make a North or N. by W. course to get into the N. E. trade-wind, which, having once fairly gained, the homeward navigation is generally well understood. In this route, after leaving the *Guinea current* in the Bight of Biafra, the ship will gradually get into the *equatorial current* as she gets to the southward; and this current frequently runs with considerable velocity. On examining my journals, I find that, by good lunar observations and an excellent chronometer, I have at various times made the following differences to the westward of dead reckoning, in the run from Saint Thomas's to longitude 20° West of Greenwich, between the parallels of 0° 35′ N., and 3° S. latitude. In 1830, the brig Ann was set 237 miles to the westward, and 78 miles to the northward of account, in 20 days. In October and November, 1831, the barque Severn was set 240 miles to the westward, and 94 miles to the northward of account, in 23 days. In October, 1833, the Freeland was set 246 miles to the westward, and 51 to the northward of account, in 20 days. In August, 1835, the same vessel was set 228 miles to the westward, and 43 to the northward, in 19 days. And, in November and December, 1836, the brig Caledonia was set 370 miles to the westward, and 107 miles to the northward, in 18 days. But it may be observed that, in the latter vessel, I never crossed the equator, but was generally 8 or 10 miles to the northward of it until I crossed the meridian of 12° W. In the above runs I have occasionally, but rarely, found slight differences to the southward. When to the southward of the equator, abreast of the Bight of Benin, I have always found a current running at least three-quarters of a mile an hour to the northward."

The Backasey land divides the RIO DEL REY, OR KING'S RIVER, from that of Calabar, the entrance to which is about 2½ leagues from Backasey gap; the western point of the river is bluff and rocky, having a reef stretching two miles to the eastward, and is but little frequented in the channel; the depth of water is not more than 2, 2½, or 3 fathoms, muddy bottom. The HIGH LAND OF CAMAROENS lies to the eastward of the

Rio del Rey, and has a remarkable high peak 13,000 feet above the sea, which may be seen at a considerable distance. The RUMBY LAND lies to the northward, and extends 9 leagues north and south; and an insulated mountain, called Qua Mountain, stands 7 leagues N. W. of the Rumby hills. With the peak of Camaroens S. E. ¾ E. (E. S. E. ½ E.), the highest peak of Rumby E. N. E. (N. E. ¼ E.) and Qua Mountain N. E. by N. (N. by E. ¼ E.) you will be without the bar of del Rey river, 2½ leagues S. S. W. of Backasey point, which is the western extremity of the entrance.

RIVER BIMBIA. From the Rio del Rey to the river Bimbia, a distance of 16 leagues to the south-eastward, the land is thickly wooded. An insulated sunken rock lies 2½ miles to the southward of the entrance, between which and the coast are 3 to 4 fathoms water. Vessels should cautiously avoid this danger, if bound to the river Camaroens, the entrance of which lies 4 leagues more to the eastward; the intermediate soundings increasing from 3 to 6 fathoms, as you approach the mouth of the river. The RIVER BIMBIA may be known by an islet, on its western side without the entrance, which extends a mile north and south, distant about half a mile from shore; there is anchorage, in 16 feet water, on its N. W. side; the watering place is on the west side of a small cove, about a mile to the north-eastward of the anchorage. The bar of the river Bimbia is two miles broad, extending to the south-eastward of the islet, and has on its shoalest part 13 or 14 feet water; within the bar there is a depth of 4 to 7 fathoms. To the westward of Bimbia point are three small islets, in the form of a triangle, affording anchorage between them in 7, 8, or 9 fathoms.

CAMAROENS AND MALIMBA RIVERS. Vessels bound to the river Camaroens, or thereabout, commonly make the N.W. point of the island of Fernando Po, which shall be hereafter described, and shape their course accordingly. From the river Bimbia to that of Camaroens, a distance of 11 miles, the coast is low and covered with trees. Cape Camaroens, the north point of the entrance, is also of this description, as well as Point Suellaba, the south extremity; the two points bear S. by E. ¾ E. and N. by W. ¾ W. (S. E. ½ S. and N. W. ½ N.) 7 miles from each other; but the shoal grounds extend half way across the entrance and narrows the channel, which lies on the north side: this spit has a chain of heavy breakers, called the Dogs' Heads, which may be seen a great distance, and require a good berth, as the tide sets over them with rapidity. The north point of Malimba river bears, from the inner extremity of Cape Camaroens, E. ½ S., 9½ miles, and the south point S. E. by E., 9½ miles. On entering give the Camaroens' land a berth of half a league, and you will sail in the best water into the estuary of the two rivers, with Malimba point nearly east, until a sandy islet, bearing S. S. W. ¼ W., and Point Suellaba are in one: here you will have 4 or 5 fathoms of water in the stream of the two rivers, two miles below a long spit of sand extending from Malimba point 4½ miles below that point; the inner point of Camaroens bearing W. N. W. ¾ W., 5 miles. Greenpatch point, on the east side of Bimbia creek, appearing between that and Mordecai creek, N. by W. ¾ W. Gallows point, on the north side of Camaroens river, N. N. E. ½ E., and Malimba point nearly East. From this roadstead you may proceed up Camaroens river, by bringing the rugged trees on the east of Gallows point to bear E. N. E., and run directly for them, until you get over the flats of 2¼ fathoms that form the bar of the river; and as soon as you deepen water, 3 and 3½ fathoms, you enter into what is called the Old Hole.

Eight miles beyond Gallows point is Enguias point, and 3 miles below it, on the same side, is Mungo creek; by bringing the point about two ships' length without the bushes at the water's edge, below the creek, you clear the middle grounds of the river, and advance within a musket-shot of the north shore, at the rugged trees near Gallows point. Proceeding upwards, about two miles above those trees, steer more for the mid-channel, keeping the gap up the river about a sail's breadth open; you may then run up to the road off King George's Town, on the south shore, taking care to give a good berth to Doctor's point, which lies 3 miles below it. The anchorage off George's Town is in 5 fathoms; the tide flows in the road, on the full and change, at 6 o'clock, and the rise is between 8 and 9 feet. It is high water at Cape Camaroens at half-past 5 o'clock.

The river Borea is distant 16 miles, S. ¼ E. (S. S. E.) from Suellaba point, the coast between is low and well wooded, and continues so to the termination of the BIGHT OF PANNAVIA, which ends 38 miles, S. by E. (S. S. E. ¾ E.) from Borea river; this river is only navigable for boats, being rendered impassable by a bar at the entrance.

RIVER CAMPO. In the bottom of Pannavia bight a vessel may safely anchor near the shore in 4 or 5 fathoms, muddy ground. From Point Garajam, known by its cascade, at the south end of the bight, the coast trends to the Rio Campo, S. S. W. ½ W. (S. ¾ W.) 13 leagues, this river may be recognised by two mountains to the northward, named, from their similitude, the Saddle and Table hills, the former lying to the northward of the latter. On the south point of the river the sea breaks with much violence on a shallow stone bank that appears at low water. There is good anchorage in 4 to 6 fathoms, 4½ leagues from the river Campo in the cove of Bata. At this place you will see the *Seven hills*, lying in a row, about 6 leagues inland, the middle one appearing higher than the others.

The RIVER ST. BENITO lies 16 leagues, S. W. ½ S. (S. by W. ¾ W.) from the Rio Campo; its entrance is narrow, but it has not less than 3 or 4 fathoms which extends 4 miles within it. The Heybern is a high hill which renders the north point remarkable; the south point is distant two miles from it, and is steep-to; a reef extends along the coast, having rocks over and under water, to the inward of the river. From the river Benito to Cape St. John, bearing S. W. ¾ W. (S. W. by S.) 10 leagues, the coast is irregular, rocky, and foul, and is distinguished by a high mountain inland, called the Mitre hill. As you approach about half way to the cape, the coast, from being low and woody, is rocky, and the cape itself is surrounded by a ridge of rocks, and has a small stony bank of 7 or 8 fathoms lying 2 or 3 miles from it.

CORISCO BAY. The N. W. point of Corsico bay bears S. by E. ½ E. (S. E. ¾ S.) one league and a half from Cape St. John, nearly midway between this point and Cape Esterias which is 10 leagues; to the south lies Corisco, or Thunderbolt island, which is more than 3 miles long and 2 miles broad. It is a low island overgrown with high trees, that seem to stand in the water; about a mile from its S. W. side is a small islet, named Laval, encompassed with a reef; from the S. E. end of Corisco extends a narrow reef, half a league to the eastward, and a shelf also extends from the northern shore. The north point of Corisco bay assumes a semicircular form, 4 leagues in breadth, and into the N. E. side falls the river Mooney, or Rio de Angra; this river is a mile wide, and at a distance of 5 miles from the entrance lie a cluster of islets, rocks, and shoals, called the Elobey, or Mosquito isles. In the direct course between the depths are from 6 to 5, 4½ to 3 fathoms, but more to the south are several shoal spots of 2 and 2½ fathoms; the least depth on the bar is 13 feet.

Corisco Bay trends nearly due south from the river Mooney, 7 leagues, to the river Moondah, which is 5 miles in breadth; the water is shoal at the distance of 3 miles from the coast in this space. At the entrance of the Moondah are 3 to 5 fathoms. The entrance bears S. ¼ E. (S. S. E.) 28 miles from the N. W. point of the bay; and from the western point of the river to Cape Esterias, the coast trends W. ¼ N. (W. S. W. ½ W.) 4 leagues. Little Corisco Island bears S. by E. ¾ E. (S. E. ½ S.) 5 miles from the S. W. point of Corisco, and is surrounded by several shoals, as well as the flat that stands a league and a half to the S. W. Between Little Corisco and Cape Esterias there is a channel of 5 and 6 fathoms, but the water shoalens half-way over from the south shore, as the coast about the cape is foul and rocky; but from hence to Point Clara, at the entrance of the river Gaboon, it is in general bold, distinguished by trees, and, at half a league distance, varies in depth from 7 to 6 and 5 fathoms.

RIVER GABOON. Point Clara is distant 7 miles S. by W. ¼ W. (S. ½ E.) from Cape Esterias; and although the coast between is pretty clear, yet about the point itself are several sunken rocks. On the south side of the river is Sandy point, which bears S. ¾ W. (S. by E.) 10 miles from that of Clara. King Qua Bens Town stands on the eastern shore, facing the sea, S. by E. ¾ E. (S. E. ½ E.) 3 leagues from Point Clara; and King Glass Town stands 3¼ miles S. by E. ½ E. (S. E. ¾ S.) from the former. About a league N. W. of Sandy point are several shoal spots, which vessels coming from that side must avoid. Coming from the northward, you may approach within half a league of Point Clara, making allowance for the stream of the river, which sets strongly on that side; the bottom, as you approach, is very irregular and rocky, as you will at times have 15 or 16 fathoms, and at the next cast have only 5 or 6 fathoms. The course in is S. by E. ½ E. (S. E. ¾ S.) 5 leagues, towards Oweendo or Red point, which is S. by E. (S. S. E. ¾ E.) 6½ miles from King Glass Town. Two miles south-eastward of Red point is Darnbee or King's island; and 3½ miles south-westward of this is Parrot or Embene island, between which are 6 and 7 fathoms.

Round Corner point is 4 miles S. W. by W. ½ W. (S. W. ¼ S.) from Sandy point, and is distinguished on each side by elevated land, which serve as good marks for the Gaboon. Vessels coming from the southward should give this point a good berth, and steer towards Point Clara, in order to avoid the shoals lying to the N. W. of Sandy point. There is anchorage in 5 to 6 fathoms a mile from the shore, anywhere between Cape Clara and King Glass Town. In the Bight of Biafra, from June to October, the winds often vary much from S. S. W. to S. S. E., in the course of the day, so as to render it advisable for vessels beating to the southward, to tack accordingly, and take every advantage of a slant: it may likewise be well to stand in for the shore after midnight, for the benefit of the land-wind, which sets in toward the early part of the morning. The current commonly runs to the northward, about 18 miles in the 24 hours, but with the change of the moon it sometimes varies to the southward.

Vessels from Calabar River to Sierra Leone are sometimes prevented, by contrary winds, from proceeding by the N. W. of Fernando Po, and in that case they may pass to the eastward of that island, and avail themselves of a strong current setting to the southward; they may pass either to the eastward or northward of Prince's island, as the winds permit. To the westward of this island, the current generally sets strong to the N. E., at the rate of a knot and a half. Having arrived to the southward of Prince's island, if the ship will lie no higher than W. N. W., tack immediately, and endeavour to cross the equator, by which you will keep out of the strong N. E. or Guinea current, that sets towards the Bights of Benin and Biafra.

Having crossed the line, you are nearly out of the easterly current, and in about the parallel of 1° S. will find it setting to the westward, one mile an hour. In May and June, when the sun has a high declination, the trade-wind is far to the southward, and you will not gain the regular breeze nearer than 3° S., when it commences from S. by W. As you make westing the wind will be found to haul more to the southward and eastward, and the current increases to the rate of a knot and a half in an hour, until you arrive as far as 15° W.: do not get to the eastward of this meridian until you reach the parallel of 8½° N., when you may steer direct for the cape, your soundings varying from 20 to 12 fathoms, as you approach within 6 or 7 leagues of it.

SECTION V.

THE ISLANDS OF FERNANDO PO, PRINCE'S, ST. THOMAS', AND ANNO BON.

FERNANDO PO. This island is about 12 leagues in length, from north to south, between the parallels of 3° 12′ 30″ and 3° 47′ N., and 6 leagues in breadth; it is uncommonly high, and may be distinguished at the distance of 20 to 25 leagues. An English settlement was established here in 1827, which, in honour of his Royal Highness the Duke of Clarence, was named after him, and which it appears, from recent information, is in a prosperous condition, though by some it is considered doubtful whether it may be attended with any ultimate advantage. It has been stated in former directions, that the island of Fernando Po made in three hummocks; but this mistake has been occasioned by the high land of Camaroens, which may be taken for the island at a distance. On coming from the N. W., it makes in two high peaks, the eastern one being the highest, and terminating in a sharp point; the westernmost is round in the top, sloping gradually to the water's edge.

GEORGE BAY is on the west side of the island, situate about 7 leagues to the S. W. of the N. W. point, between Point Kelly on the N. E. and Charles Folly on the S. W., 7 miles distant from each other; the bay is of a semicircular form, much exposed to the N. W., and the depth decreases from 30 to 20 and 10 fathoms. Goat and Kid islands lie about half a league to the northward of Point Kelly, and are encompassed with several rocks, but the ground on the S. E. is clear, and affords convenient shelter. Vessels from Bonny river, bound to George bay, should make the west end of the island, as a strong current sets to E. N. E., that with baffling winds may take you several days to get up, if you once get to leeward. In making the island, you will perceive its appearance as we have already stated; but should you fall to leeward, so as to bring the eastern peak to bear East, or E. by S., you must tack, and close in with the shore, giving it a berth of one or two miles, until you get in sight of Goat island,* the soundings gradually diminishing to 16 or 15 fathoms. Anchor with the east peak bearing E. ½ N., Goat island N. by E. or touching Point Kelly, the N. E. point of the bay, and Charles Folly W. by N. ¼ N., three-quarters of a mile from shore. Water and wood may be had here in abundance, and fish is also plentiful and various.

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* At 5½ miles to the northward, and 2 miles from shore, nearly on the meridian of Goat island, is a reef, about one mile in extent, *true* North and South, and steep-to.

Maidstone Bay and Clarence Cove. Maidstone (or N. W.) bay lies within the N. W. point, and is a shallow bay, 2½ miles in extent; it is bounded on the eastern side by a tongue of land now called Point William, between which and Point Adelaide, distant half a mile S. W. by W. ½ W., is Clarence Cove: this is a small bay of a semicircular shape, having soundings in the middle from 14 to 12 fathoms. Cockburn cove lies on the west of Point Adelaide, and is not so large as that of Clarence. Adelaide islets lie in a cluster, about one-tenth of a mile to the northward of the point, being divided from it by a passage of 9 and 10 fathoms; a bank extends some distance from the islets, but it has not less than 3 or 3½ fathoms; a shoal also extends to the westward of Point Williams; and on the east side of this point is Goderich bay, not more than three-quarters of a mile in extent, indented by several small coves, and in which are some rivulets, two of which are named Hay brook and Horton brook. It is high water, at the full and change, at Clarence town, at 4 hours; rise 7 feet.

Remarks of Commander Fishburne, H. M. Steam-Vessel Alban, *3rd December*, 1841.—"The anchorage of Clarence cove, the principal anchorage of Fernando Po, situated on the north side of the island, is very good, though the depth is from 10 to 15 fathoms; indeed, it is so abundantly sheltered, that considerable facility is afforded to vessels loading or unloading, while the perfect tranquility and smoothness of the water, and rise of 7 feet, admit of vessels being beached for repairs, without danger. At present, a fire is kept by the Company's servants during the early part of the night, and being at the height of 100 feet above the level of the sea, it may be seen at a considerable distance. By bringing this on a S. by E. (true) bearing, and Point William one mile or a mile and a half distant, fair anchorage and a good position for entering will be found. It must be borne in mind, that the current runs to the East and N. E. generally, one mile to a mile and a half per hour; and due allowance must be made for this, in steering either for the settlement by day, or the light by night, depending on the preceding winds. Change in the bearings would give notice of this, and they should be attended to strictly.

"The water is good, and may be obtained in any quantity without difficulty. Wood is plentiful, and of very superior quality, quite equal to the mangrove, 340 inches per horse-power, per hour, being sufficient to keep steam with our engines working expansively at half-stroke, yet still an efficient fuel. We paid six shillings and sixpence for 100 pieces, containing about 33 cubic feet; but were a contract entered into for a large quantity, it might be obtained at a much more reasonable price. The landing-place is convenient at a wooden pier, which has been built at the expense of the West African Company, and extending out to a depth of water that admits of vessels of 7 or 8 feet draught to go alongside. The ascent to the plateau, upon which the town stands, being about 100 feet, and the road ill made, occasions much difficulty in the transfer of goods to the town, but this objection might be materially removed, and without much expense. There is a strip of land, and on either side of the landing-place, (from which the cliffs rise nearly perpendicular) now partly occupied by miserable coal and store sheds, but of sufficient width, and generally adapted for good store-room."—*Nautical Magazine for* 1843, *page* 83.

The natives of Fernando Po were not considered of a friendly nature, but we hope the new settlement will prevent mariners experiencing any inconvenience from this trait of character, and be the means of subduing the angry disposition which was said to exist among them.

PRINCE'S ISLAND. This is an irregular-shaped island, 10 miles in extent from north to south, and 5 miles wide. Should the current, on approaching the island, be found running to the N. E., it will be best to make it on the south side, or you may be swept to leeward, and experience some difficulty in making the harbour; but it will be better to make it on the north side, with a south-westerly current. Vessels approaching this side of the island will see a high peak towards the S. W. end, appearing like a sentry-box; and, more to the eastward, a remarkable round-topped hill, of a sugar-loaf shape, called the Parrot's Bill. In approaching the south side, there is a high white rock or islet, lying half a league from the south point, called the Dutchman's Cap, and about 9 miles south-westward of this are the rocks above water, called the Brothers.

Port St. Antonio lies on the N. E. side of the island, the entrance to which is distant 8½ miles from the Dutchman's Cap. The anchorage is clear, and the depth of water regular from 10 to 4 fathoms. It is exposed to tornadoes, but as the entrance is narrow, accidents rarely occur; it is, however, necessary for vessels to be well secured, for they blow directly in. The entrance is defended by two small forts, and is of easy access; in going in you may stand to the south shore in 6 fathoms, and to the north shore, it being steep-to, in 10 fathoms. There is a coral reef of 5 fathoms, a mile and a half from the fort on the south side; about a cable's length without that, are 9 and 8 fathoms, soft mud, and good holding ground, to one or two miles further in. Ships should moor with an open hause to the sea, in order to be prepared for the tornadoes. The town stands at the bottom of the harbour.

On arrival, the vessel must be reported to the governor, who sends custom-house officers on board, at the ship's expense; and on quitting the harbour, forty dollars are exacted for port-dues and anchorage; in addition to which, if coming to trade, the customs demand forty more.

Agulhas, or West Bay, lies about half-way down on the western side of Prince's island. It is open two miles in extent from N. E. to S. W., shoaling in depth from 20 to 4 fathoms. Some small rocks under water extend from its south point. The best situation to anchor in this bay, is with its west point bearing W. N. W., distant three-quarters of a mile, the north point N. E. by E., and a peak on the island S. E. by E. ½ E. There are several good streams of water on the south side of the bay. This place is secure from *troverdoes*, though open to N. W. winds, but the latter seldom occur.

In the vicinity of Prince's island, the winds are generally between the south and west; in sailing, therefore, out of the harbour, or port St. Antonio, with a land-wind, endeavour to get under way with this breeze, keeping well over towards the south shore, for, on advancing outward, the wind will be found to draw gradually to the southward, which, with the swell, may set you over to the north side, near the Diamond rocks.. If bound to the westward, you need not beat to the southward of St. Thomas; but if to windward of Prince's island, and the wind admits of your making westing without northing, keep on the larboard tack, and so proceed as to take advantage of the equatorial current.

About Prince's island are several rivulets of excellent water, but it does not equal St. Thomas, for the goodness and abundance of its provisions.

ST. THOMAS. This island bears about S. W. by W. (S. W. by S.) 22 leagues from Prince's island. It is 8 leagues in extent from north to south, of an oval form, with the south point nearly on the equator; it is high, conical, and well wooded; its highest peak is usually covered with a cloud, and appears like smoke. Vessels from the windward and Gold coasts, bound to St. Thomas, must choose the time of the ventanias, or hard breezes, that blow from April to September, making proper allowance for the currents.

Man-of-War Bay, on the N. E. side of St. Thomas' island, is considered a safer anchorage than that of St. Anna de Chaves, to the south-eastward. Vessels coming in along the north end of St. Thomas, will perceive the land mountainous and very high; when abreast of the island, it sometimes seems divided in two, and it will then be proper to keep to the E. by S. till you are past Cabrita island, which separates one anchorage from the other. Man-of-War Bay is a safe place for small vessels, but large vessels are obliged to lie out in the open road, in 10 to 18 fathoms, which is a safe place, except during the season of the tornadoes, as they prevail from N. E. directly upon the shore. Anchor in the bay, with Cabrita island (which makes like a saddle) bearing S. E. ¼ S.; Misericordia chapel, seated on a hill, on with a black rock on the shore, S. by W.; and the white mansion, called Fernandilla house, S. W. ¼ W. The ground in this bay is good, and the water in general smooth, except during the season before mentioned; the soundings in are irregular, from 30 to 6 fathoms, which latter depth is about one mile from shore. From the anchorage the watering-place is about a quarter of a mile to the eastward, and is easily obtained.

St. Anna de Chaves Bay, or Roadstead, is defended by a stone fort, standing at its southern entrance. In sailing to this place you will find it best and most convenient to stretch round the south part of the island, for then you will be favoured by both wind and current, which latter sets strongly to the northward; and the shore, to the southward of the fort, may be approached with greater safety than that to the northward, though not within the distance of one mile and a half, until you get the fort to bear W. by N. About two miles to the eastward of the town lies a shoal of white sand, with only 2¼ fathoms over it, on which the *Chesterfield* struck in 1781. This ship went round the northern part of the island, obtaining no ground at 60 and 50 fathoms, until the rocks were seen alongside of the vessel; soon after this she sounded in 16 fathoms, and suddenly grounded. When aground, the fort bore W. by S., Cabrita island N. W., and the eastern point of the island S. by W., distant from shore about 4 or 5 miles, and from Cabrita nearly 3 miles. Being hove off this shoal, she steered for the road, bringing the fort to bear from W. to W. by S., anchoring in 6 fathoms, sand, shells, and coral rock, the fort bearing W. S. W., Cabrita island N. by W. ½ W., south end of St. Thomas S. ½ W., and its northernmost point N. W. ½ W., about two miles distant from the shore.

The *Tartar* anchored in 5½ fathoms, the fort bearing S. W. by W. only one mile from shore; the *Blandford* much further out, and the *Grampus* found good anchorage in 6 fathoms, the fort bearing West, and Cabrita island N. N. E. It thus appears that vessels coming in from the northward, must not depend upon the lead, because, from no ground a ship may have 12 fathoms, and be aground before they can obtain another cast of the lead.

ROLAS ISLAND lies about two miles off the S. W. end of St. Thomas, the channel between lying directly under the equator, and affording safe anchorage for the largest vessels. It must be entered from the eastward, as a bank extends from the north shore of the island. About 5 miles east from Rolas island lie a cluster of high rocks, appearing from the northward like ships under full sail, called the *Seven Stones*, or Brothers, and sometimes mistaken for part of the island itself.

Vessels from the Northward, and bound to St. Anna de Chaves Bay, should make St. Anna's isle, or Postillion Cap, which lies off the eastern coast; and when this comes in sight, you will perceive a small black fort in ruins, on the shore towards the S. W.: steer for the latter, until St. Anna isle comes in a line with the low green point, to the southward of the black fort; and with this mark on, bring the new fort or castle, on the S. E. point of the bay, to bear W. S. W.: here you will have 6 or 7 fathoms, sandy bottom, distant a mile and a half from the castle, with Cabrita island bearing N. by W. ½ W. Ships should not approach Cabrita nearer than to bring the new fort to bear S. W., for beyond that bearing the water is shallow, full of Coral branches, the depth not more than 10 or 12 feet.

ANNO BON is a high circular island, about 8 leagues in circumference, situated about a degree and a half to the southward of the equator, in the meridian of 5° 45′ E. The anchorage is on the N. E. side, abreast of the town, in 7 to 16 fathoms, white sandy bottom, which holds well. If you moor near the shore, the mark is a round islet, of a sugar-loaf form, between which and the land there is a fair channel: here you will perceive seven rocks above water lying near the shore. Anno Bon is considered healthy, and affords abundance of fruit, vegetables, and other provisions, all of which may be had cheap in barter. There is a rivulet of good water at the south end of the island, but it is rendered somewhat difficult of access.

Anchorage of Anno Bon. *Extract from the Nautical Magazine for* 1843, *page* 89.—Commander W. B. Oliver says, "Open the low rocky point, to the westward of Pyramid rock, with the east end of the church, (the eastern building detached from the village); you may then, by keeping Pyramid rock on with a high rock over it, resembling a fort, steer in on that line, and carry sandy bottom from 19 to 3½ fathoms, within two cables' length of the beach, when Islet point will bear W. ½ N., and Pyramid rock S. E. by S., and Turtle island S. E. by E."

The Vasittart anchored in May, 1821, at Anno Bon, in 11½ fathoms, rocky bottom, with a conspicuous peak in the centre of the island bearing W. ½ S., off shore about three-quarters of a mile. Ships touching here should keep the lead going, the soundings being very irregular, with great overfalls from 19 to 11 fathoms, then 3½ fathoms. Although the vessel here stated lay in 11½ fathoms, a small anchor was necessary to steady her, and keep the bower anchor clear; for half a cable's length in shore there was only a quarter less 3 fathoms, rocks.

Nautical Observations on a Voyage to the Gold Coast. By Captain Midgley. "The extensive tract of sea between the meridian of 14° W. and 9° E., and the parallel of 9° N. and 3° S., is yet imperfectly known by the majority of navigators; being bordered by a range of coast, in a great measure peopled by an uncivilized and semi-barbarous race, who require peculiar address and management in the method of dealing with them, for the produce of their country. I shall suppose that a vessel bound to this coast has got out of the channel, or, at least, clear of Tuskar and the Smalls, in which case the master's mind will be comparatively at ease, to what it was when he had less sea-room in the narrows of the channel. But whilst the ship is in soundings, she will be more or less exposed to a Northerly or N. N. E. indraught of tide or current, which sets nine hours out of every twelve, even at a considerable distance to the westward of Scilly, and this indraught is liable to be augmented or retarded by the direction and force of the wind.

The stream, called *Rennell's Current*, sometimes sets strongly to the N. N. W. and N. W. about the edge of channel soundings, at other times very weak, and there is occasionally a strong set to the eastward. But it is highly probable that Rennell's current will be found to prevail for some days after a long series of westerly gales, as these winds materially contribute to accelerate the velocity of the currents setting into the Bay of Biscay, and by keeping up the level of the water upon the iron-bound precipitous shore of the bay itself, forces that water to find an egress out of the bay to the northward and westward; and it is not improbable that the ebb-tide of the English Channel may in some measure contribute to its westerly tendency.

To the southward of the 48th parallel, it is very probable that there will be found a S. E. current, the velocity of which will gradually increase, until the 40th or 38th parallel is attained, where I have generally found this current to get weaker, and vary more to the eastward. On the 11th of February, 1833, I threw a bottle overboard, containing the vessel's position in latitude 41° 50′ N., and longitude by chronometer 14° 23′ W., and this bottle was picked up in the entrance of the harbour of Vigo, on the 1st of March following; it had consequently traversed 80 leagues in a true E. ½ N. direction, or about 14 miles per day.

I would strongly advise all mariners bound to the southward, to pass to the westward of Madeira, if possible, as it may prevent their being entangled with the Canary islands.

On the 29th of December, 1840, the ship "John Campbell" was in latitude 33° N., and longitude 19° 24′ W., about 2° to the westward of Madeira; and with a light wind from S. S. E., the ship, about 2 P. M., got suddenly amongst some rollers. At first these rollers did not appear alarming, as the vessel, on her gradual approach to them, seemed to be only experiencing a gradual rising sea. But the rollers soon attained a considerable height, and set in regular ridges from the N. W. quarter, toppling in many places like a bore, and causing the vessel to labour and roll heavily to windward. In the evening there was an increasing breeze from the S. E., with cloudy overcast weather, and much vivid lightning in the N. W. quarter. As the weather had been moderate for several days before, I can scarcely think these rollers could have been caused by wind, as they were very unlike the sea that marks the termination of gales of wind; they came in regular ridges, and sometimes topped in a considerable breaker. The ship was suddenly among them, sailed for 21 miles through them; the rollers rapidly increased, and as rapidly subsided. The sea was of a deep dark blue colour. No bottom at 70 fathoms; barometer steady at 30° 20′, and the temperature of the air 64°, and of the water 57° of Fahrenheit thermometer.

After much consideration of the subject, I must candidly confess my inability to assign any just cause or reason for this sudden, and to me unaccountable undulation of the surface water; but, perhaps, some such occurrences may have an influence in contributing to the sudden rise of the water, which is occasionally experienced at Assension, and, I believe, also at some other elevated islands.

It was on the same passage out, and on the 3rd of January, 1841, that I passed through many clusters of the *Gulf, or Fucus Natans weed, all* of which was very much decayed. The ship was then in latitude 28° 8′ N., and longitude by time-keepers 21° 46′ W.—a position, I believe, much to the eastward of the generally assigned eastern limits of the Sargasso sea, or portion of the North Atlantic, in which this weed is generally found. But as I shall presently have occasion to revert again to this subject, I will proceed to notice the winds and currents usually found in the neighbourhood of the west coast of Africa.

Among the Canary islands, and in their vicinity, the N. N. E. and N. E. winds mostly prevail; and the general set of the currents between Madeira and these islands has a Southerly and S. S. E. tendency. Indeed, the whole surface of the ocean, from the 48th to the 30th parallel, has a general tendency to flow to the Eastward and S. E. quarter; and the mariner will do well to guard against its treacherous and too often fatal influence.

Outward-bound African vessels have of late, very generally and very properly, run through the passage to the eastward of the Cape de Verd isles, for by so doing they avoid a tract of sea, which is notoriously subject to violent squalls, calms, and heavy rain. Vessels make this run in the general limits of the N. E. trade-wind, and I have myself invariably found the current setting to the southward. I am aware that I have the high authority of Mr. Finlayson, of the Royal Navy, and of Commander Wilkes, of the United States Exploring Expedition, against me in this assertion, both of these officers having found currents in this route setting to the N. E. I must add, that I have not tried the current by any actual experiments, other than the usual method of estimating it, by the difference found by an attentive dead reckoning and actual observation; and in this case, it is of course very possible that errors creep into the reckoning, by inattention to the steerage, particularly in the night, as well as by an improper allowance for the magnetic variation, an inaccurate log-line, and other causes.

Vessels bound to the coast of Africa, in the wet season, or between May and September inclusive, need not be too anxious to make easting, for they will lose the N. E. trade-wind very soon after passing the parallel of St. Jago, and after a short interval of calm, will fall in with the variable S. W. winds, and their usual accompaniments of squalls, heavy rain, and close damp unsettled weather. In proportion as the vessel advances to the southward, she will find more settled weather, and probably be influenced by a current to the S. E.: this is a branch of the great Guinea current, which I shall presently attempt to describe. The track I have just noticed is perhaps the most luminous part of the Atlantic Ocean. In the wet season, vessels should give St. Anne's shoals a large berth to the eastward, as the current, as well as the sea, runs with great velocity into the bight of Cape Mount; and vessels which may unfortunately happen to fall in with the land to the northward of Sinou, in the wet season, will find considerable difficulty in working to the southward.

The first influence of the Guinea current will be found in about 9° 30′ N., and inshore of the 22nd meridian, and gradually verges from thence in a S. S. E. and S. E. direction, running with considerable velocity in a parallel direction to the trend of the land, and at least 50 leagues from it. On approaching the land, the current will be found to increase in velocity, and requires constant and unremitting vigilence to prevent the vessel running to leeward of her destination. On the 18th of January, 1841, in latitude 6° 48′ N., and longitude 14° 58′ W., whilst in the influence of the Guinea current setting true S. E. by E., at the rate of 30 miles in the 24 hours, at daylight in the morning, during a perfect calm, I was surprised to see the vessel surrounded by sprigs of the Sargasso weed, and was still more surprised at its fresh and luxuriant appearance. One of the many sprigs brought on board contained two very lively little crabs, and I observed no marks of decay about any of the weed. I ordered a cast of the deep-sea lead, but found no bottom, at very nearly 100 fathoms. Sir Hans Sloane, in his History of Jamaica, says, that this weed has been seen upon the coast of Africa; but I am disposed, notwithstanding, to think that it is of rare occurrence, as I had four very intelligent natives of the Krou coast of Africa on board, and they unanimously declared that they had never seen any Sargasso weed, or indeed any other weed similar to it, attached to any of the rocks, or floating upon the surface of the water near the coast.

From the shoal of St. Anne (which by the bye requires the exercise of considerable judgment and caution) the Guinea current has an easterly and E. N. E. tendency towards the bight or bay of Cape Mount; to the southward of this, it sets about E. S. E. along the shore; and from Grand Sestros to Cape Palmas, it runs with a velocity of more than two miles an hour. It is this current which has set several vessels upon Coley's rock, the Cape shoal, and Rock Town reef, in the neighbourhood of Cape Palmas; and these dangers can only be avoided, in the night, by the constant and unremitting use of the lead; for by keeping in 38 fathoms, or any *greater* depth of water, the vessel will drift in a fair way round the cape, and be 3 miles clear to the southward of these dangerous reefs. On the meridian of Cape Palmas, the mean breadth of the easterly stream of current is fully 45 leagues, and it keeps this breadth throughout the whole of its easterly course, until it is lost in the Bight of Biafra. The inshore branch of this great stream diverges to the northward and eastward at Cape St. Paul, and fills up the Bight of Benin, from whence it runs with increased velocity round the land of Formosa, and over the great bank of soundings, which extends from the mouth of the Nun River to the high land of Cameroons. Between the meridians of 8½° W. and nearly 9½° E., a distance of more than 1000 miles, we are presented with the somewhat singular anomaly of two mighty streams of water, silently, yet certainly pursuing their course parallel to each other, but in directions diametrically opposite. I of course here allude to the equatorial current, which sets to the westward, as I shall hereafter show, with considerable velocity. The mean northern boundary of the equatorial current is generally found about the equator, or about 110 miles from the southern border of the opposite stream. In the tract of sea between these streams the current is variable, but has a general tendency to run to the northward, particularly abreast of the Bight of Benin.

It is a well-known fact, that during the wet season, or from May to October, the Guinea current almost invariably runs to the eastward with increased velocity. I can rationally account for its ingress and egress in the Bight of Benin; but the whole of this immense body of water appears to be confined in the Bight of Biafra, or at least it has no known outlet, for throughout the whole of the bight, to the northward of Prince's island, the current, in the wet season, almost invariably sets to the N. E. and E. N. E. with such force, that vessels are frequently fourteen days in beating up from Bonny to Prince's island, a distance of only 60 leagues. I am aware that Mr. Finlayson has asserted, that a strong current runs to the southward out of the Rio del Rey; but this current is not found to the southward of Fernando Po. On the contrary, the current upon the east coast of the Bight of Biafra generally runs strong to the northward, and I have been three days, in tolerably smart vessels, and with a constant steady breeze, in weathering the island. The only advantage I ever found in beating up through the eastern passage, was derived from the smoothness of the water, and not from a southerly current. How then do the accumulated waters of the Bight of Biafra escape? Is there an undertow, or is it the great reservoir which supplies the tides of the 23 large rivers in the bights, most of which are so many mouths of the Niger?

The bank of soundings along the Krou coast, from Liberia to Cape Palmas, extends only 7 or 8 leagues from the land; and on its extreme outer edge, which is very abrupt, there is a depth of 55 to 62 fathoms, generally sandy bottom, or sand and ooze. At only one mile to the westward of this depth there is no bottom at 90 fathoms, and the water continues of the deep blue oceanic colour, even in 15 fathoms. On this part of the coast no vessel should shoal her water under 32 fathoms in the night, and in the neighbourhood of Cape Palmas, as before observed, not less than 38 fathoms. In this depth of water the early part of the day will be soon surrounded by canoes. A fire on the beach is a signal that the natives are desirous of trading. The natives of this part of the coast are of mild and gentle demeanour, and any number of them may be allowed to come on board the vessel, without the slightest reservation, for they have no spirits in their possession to sell to the crew.

The Kroumen are in many respects an extraordinary race of people; and Capt. Adams has justly remarked, that the tower of Babel might have been built upon the western shores of Africa, as a different language is spoken at every ten or twelve miles, though these different languages are generally understood by the natives all along the coast. The Kroumen have a singular custom peculiar to themselves, which is a system of apprenticeship. A number of young men will attach themselves for a certain period to a headman: this headman has made one or more voyages to leeward, to the Oil rivers, before he can obtain a name, or be allowed to build a house, or to trade; and it is the duty of this headman to ship the boys off for the Oil rivers on board of any vessel he can, and for this service the headman is entitled to the one month's advance always paid by the ship; he is also entitled to a certain portion of the boy's wages on his return. When the boy has made two or three voyages, and speaks English fluently, he becomes a headman himself. The language of the Kroumen is principally a combination of vowels, and from the peculiar nasal pronunciation can rarely be acquired by Europeans. The Krouman is generally found faithful in a strange country, but must not be trusted in his own.

In proportion as the vessel advances to the eastward, the natives will be found more barbarous, and consequently more treacherous; and about Drewin and St. Andrew's they were formerly a fierce, unruly, and sanguinary race, notorious for their treachery, and repeated attacks upon vessels. I have had no intercourse with these people for the last seven or eight years, but am assured that their condition and manners are very much improved, and that small vessels may now trade there for ivory and palm oil in perfect safety, by adopting only common precautions. The St. Andrew's people have been repeatedly fired upon by the crews of different vessels, for various acts of theft and treachery; and it was formerly very unsafe to allow more than five or six of them on deck at once, as they generally come on board armed with a long knife, in the use of which they were very dexterous. Upon one occasion, I very suddenly dispersed a multitude of them off the deck, upon the very point of open warfare, by merely throwing about a dozen heads of leaf tobacco over the side, for they all immediately jumped overboard after it. Upon another occasion, the plentiful distribution of boiling water amongst a crowd of them proved quite as efficacious. On board a French barque, where two of the crew had been wounded by the knives of the natives, they were beaten off with empty glass bottles, a large quantity of which happened to be on deck at the time for trading with. Harsh as these measures may appear, they are surely more humane than the use of cutlasses and muskets.

The natives of Cape Lahou, in many respects, resemble the Kroumen in their manners and disposition, and, like them, are almost amphibious. Cape Lahou may be considered the western extremity of civilization, on this part of the coast of Africa, for the Gold coast may be here said to commence. The first Englishman who visited this part of the coast for the purpose of trade, was Captain John Lok, in 1554, but it is very probable that this coast was known to the Portuguese at a much earlier period; for it is on record that they settled at Accra in 1492, and much about the same period, or about the latter end of the 15th century, the Portuguese discovered Fernando Po.

The best gold upon the Coast of Africa is found in the neighbourhood of Grand Bassan and Cape Apollonia. It is tolerably good at Dixcove, Cape Coast, and Anamaboo, and the Accra gold is generally considered of inferior quality; but little, if any, gold is found to the eastward of the River Volta.

From Ningo to Old Calabar river, an extent of coast of several hundred miles, there is not a single stone to be found that is as large as a walnut. And from the river Sherbro to Cameroons, an extent of 1500 miles of sea coast, there are only four eminences which exceed the height of 300 feet, and these are the high lands of Capes Mount and Mesurado, and the Cook's Loaf and Devil's Hill, near Wimmebah. A very old authority, Governor Dalzeil, has truly said, that from the river Sherbro to Benin, a tract of 1400 miles of sea coast, there is not one navigable river, bay, or harbour, into which a ship can enter. Nor is there one river or creek (the Volta and Lagos excepted) into which a sailing boat can advance 10 miles from the sea. Very few of the creeks will even admit a boat, and not one on the Gold coast, except at Chama and Elmina: a small boat may row up Chama creek about two miles, and up Elmina creek about a quarter of a mile. The shores are almost in every part difficult of access, from the heavy surf which breaks upon the beach; it is scarcely possible to land anywhere but in a light canoe, and even in that way it is frequently impracticable for days together; in many parts, besides, there is near the shore scarcely water enough for a canoe, and the breaking of the waves becomes there so impetuous, that all communication between the shore and the shipping is frequently interrupted for three weeks together, and can seldom be effected with safety.

A most extraordinary refraction prevails upon the whole line of this coast, which is very likely to mislead the mariner, and induce him to neglect the frequent use of the lead, which is the only unerring guide, and sure safeguard all along it. Tornadoes are very prevalent along this coast, from October to April or May, except during the season of the Harmattan or easterly winds, which generally occur in January. They commence with a heavy dark cloud in the S. E. quarter, attended with awful lightning and thunder, and always give the mariner ample time to prepare to encounter their dreadful impetuosity. Every common squall from the S. E. must not be taken for a tornado, although they are called by that name. There are very seldom more than three or four tornadoes in a season, and when once experienced, are not very liable to be afterwards mistaken. As a general rule, it may be considered, that as the arch of the rising squall is well defined, so in proportion will be the violence of the tornado.

The navigation of the Bight of Biafra presents no peculiar feature to the attention of the navigator, if I may except the strong N.E. currents, which almost invariably prevail in it; and every exertion should be made to cross the equator as soon as possible, for by so doing, the ship will find much less current, and the winds will be generally more from the southward. Many navigators have remarked, that on standing to the westward, between Prince's and St. Thomas's, even when making a trifle of northing, the N. E. current has been found to diminish in strength as the vessel makes westing. Even as far to the southward as 3° S. there is very seldom any easting in the wind, until passing the meridian 5° W. But the vessel will find a westerly set, before reaching the meridian of Greenwich; and this set is carried by the equatorial current, which, running in a N. W. and W. N. W. direction from the South Atlantic Ocean, sets with considerable velocity to the westward, in the neighbourhood of the equator, until it strikes upon the shores of Guayana, where its influence being considerably strengthened by the E. N. E. trade-wind, it raises the level of the Mexican sea, and finds an outlet through the Strait of Florida, where, being opposed by the coast of Carolina, the banks of the American continent, and perhaps by a stream of current, which is well known to set out of the Greenland seas to the S. E., it assumes a more easterly direction, until its force is gradually expended, but very little to the westward of the Azores.

From what I have just said, it will at once appear evident, that the voyage of the mariner will be accelerated or retarded, according as his ship may be situated in one or the other of these currents, and that to a mean extent of about 30' to 36 miles a day. Fernando Po is famous for the finest yams, and perhaps the purest water in the world. Prince's island possesses a very superior description of coffee; and St. Thomas is a very elevated island, which possesses excellent coffee and fruit. Anno Bon possesses abundance of stock, which can be best procured in exchange for old cast-off clothing or slops.

The homeward passage from Africa may be made in two different tracks,—the one may be called the precarious, and the other the certain track. The precarious track is to run along the coast, and on giving Cape Palmas a berth of about 100 miles, steer to the N. W., towards the Cape de Verd islands. This track, owing to the prevalent calms, can only be pursued with advantage when the sun has northern declination; and then the mariner must be particularly careful he does not fall to the eastward of Cape Palmas, or into the Guinea current, against which he will find it a very hard matter to work to windward. The certain route, at all times of the year, is to get into the equatorial current as soon as possible, and, aided by its powerful influence, you will find the ship gain very fast to the westward; and I think it advisable to cross the equator in from 20° to 21° W., near which meridian a current is very generally found setting to the northward, and from this position the homeward navigation is generally well understood.

Southerly and south-west winds are generally most prevalent between the trades, and these winds are strongest between May and August inclusive. In July, particularly, these winds blow in excessively violent squalls, and the heavy short sea which they occasion, added to the almost ceaseless rain which falls in these parallels, renders the navigation in this track peculiarly annoying and unpleasant. On the 17th December, 1836, when in latitude 9° 31′ N., and longitude 24° 18′ W., about 326 miles due south of Fogo, when in the brig Caledonia, of Glasgow, I fell in with a very extraordinary kind of weed, and which I have never but in one solitary instance ever before heard of. The instance I allude to was noticed by the talented Humboldt, who fell in with similar weed, in the channel between Clara and Allegranza. The weed was of a brownish green, with thick, friable, circular leaves, indented at the edges, with stems about three inches long. The weed appeared tolerably fresh, with a gelatinous substance, and very minute barnacles adhering to it. Humboldt brought similar weed from the bottom, in a depth of 30 fathoms; but when I fell in with this weed, I found no bottom at 80 fathoms, and there was no perceptible current."—*Nautical Magazine for* 1843, *page* 25.

SECTION VI.

CAPE LOPEZ TO THE CAPE OF GOOD HOPE.

FANAES ISLET bears S. S. W. ¼ W. (S. ½ W.) 13 leagues from Round corner point, the coast between being safe and clean; the islet stands near the shore, the river Nazareth bears from it S. W. by W. ¼ W. (S. W. ½ S.) 16 miles. The west point of this river is low and sandy, and is distinguished by the small town of Fetishe. **Cape Lopez** bears from Fetishe W. N. W. (W. ¼ N.) 17½ miles; the land to the eastward is low and sandy, covered with trees and bushes, and shoals extend from it to the distance of 5 or 6 miles.

Cape Lopez is low drowned land, and at first appears all rugged with bushes, that seem to stand in the water; it is steep on the sea-side, free from flats and reefs, and may be approached sufficiently near. The inner coast trends to the S. S. E. 4 leagues, and forms a river that falls into the sea, about 7 leagues to the southward of the cape. A spit of 2 to 3 fathoms extends to the N. E., about 5 miles from the inner part of Cape Lopez; and in a bay within this are 20 to 12 and 9 fathoms, affording anchorage in 8 to 10 fathoms. The spit must be carefully avoided in coming from the northward to Cape Lopez, as it is not noticed until you approach very near it, for you may have 10 or 12 fathoms a league and a half to the N. E. of the cape, and with the next cast find yourself aground. When you are sailing from the river Bento or Cape St. John, to Cape Lopez, always observe which way the *trovado* drives the water; and should you lie at anchor when it arises, you must weigh immediately, and get off; if it be in the morning, with a south-west or south wind, keep to seaward till noon, then stand again toward the shore with a sea-wind; but if the wind does not alter at noon, tack about for all that, and go to the shore, there to anchor in oozy, and sometimes sandy ground.

The River Mexias is distant about 7 leagues to the southward of Cape Lopez, and has anchorage off the entrance in 5 and 4 fathoms; but there is a reef that stretches half-way across the channel from the south point. The coast between this river and Cape Lopez is very clear, and may safely be approached in 7 to 5 fathoms; it is of a similar description to the southward to the river Fernan Vas, which is distant 7 leagues. Two miles from the latter is Cape St. Catherine, known on advancing from the northward by a tuft of trees, apparently separating it from the main land; but the coast appears craggy when you approach it from the southward. The river Camma lies 3 miles to the northward of the cape, and has a depth of 6 fathoms in the entrance, but from its south extremity to the point there is a continued reef of rocks and sand.

The coast to the southward of Cape Lopez, as far as the river Sette, which is distant about 13½ leagues from St. Catherine's point, is in general low and clean, having a sandy beach, covered with trees, but with no particular marks to distinguish it: there is a bank of soundings of 35 to 40 fathoms, at the distance of 10 leagues to the westward of it. In fine weather the winds usually blow from the S. W., and set in after noon, with land-breezes from the N. E. in the morning. During the rains and winter months they are frequently from the southward, and at these seasons there is scarcely any land-breeze: the current often runs with much rapidity.

The **River Sette** is the northern boundary of the Loango dominions. The land on each side is low, covered with high trees, and is not readily seen; the entrance has 3 fathoms, but, owing to a bar, is not navigable for large vessels. The town is of some importance, and stands about 20 leagues up the river. Point Piedras, or Rocky point, is distant about 8 leagues, S. S. E. (S. E. ¾ E.) from the river Sette; it is surrounded, as its name implies, by a stony reef. About 4 leagues to the northward of the point lie two high mountains, flat at the top, called the hills of the Holy Spirit. The coast hereabout is rocky, and should not be approached in less than 8 or 9 fathoms. There is great fishing on all this coast, chiefly for pargos or rocket-fish.

CAPE YUMBA lies about 50 miles to the south-eastward of Point Piedras, and appears in high hills along the shore, called the high land of Yumba; it is steep towards the sea, to the pitch of the cape, on which are some tufts of trees, from which a stony reef stretches about a mile to the S. W. Point Matooti is distant 3½ leagues to the southward of Cape Yumba, and has a ledge of rocks, some above water, extending 1¼ mile to the northward, near to which, on the west side, is anchorage in 12 fathoms. The BAY OF YUMBA is about 3 leagues wide, and 1½ deep, having good anchorage in 4 to 7 fathoms. The land to the southward of the bay is more elevated; it is covered with trees, and has a sandy beach. Banda point lies at a distance of 35 miles to the southward of Matooti, and is surrounded by foul ground of rocks and coral. In case of necessity a vessel may anchor about a league and a half to the N. W. of the point. Kilongo reef is distant 9 leagues, and is about half a mile in extent; there is a cove to the northward, which affords pretty safe anchorage in 5 fathoms. S. E. by S. (S. E. by E.) 8 leagues from Kilongo cove, is the river Quiloo; the land between is tolerably even, having some hillocks and lofty trees further in, which terminate at a tolerably high mountain, called Salomba. About 4 leagues to the southward of the cove, the land appears white at a distance, intermixed with sandy down and palm trees; the bottom along shore is sand and stone, so that you ought not approach the coast in less than 9 fathoms, and this should be observed until you reach the river: this may be recognised by the paps—two small elevations covered with wood, on the north side.

LOANGO BAY. This bay is distant 12 leagues S. S. E. ½ E. (S. E. ½ E.) from Kilongo point; it is about 4 leagues wide, and the road is good and well secured. You anchor with a clump of trees, called Looboo wood, bearing nearly S. E., in 6 to 4 fathoms. A reef of stones, called the Indian bar, on which the sea breaks, stretches about a league from the south point, and must be carefully avoided. The Red hills surround Loango bay, and extend to the northward of it, towards Quiloo river; they are steep on the shore, with bushes and palm trees; they are marked with ravines and fissures, and resemble dirty chalk cliffs, gradually declining to a low land in the centre of the bay. There is a bay, about 2 leagues wide, between the south point of Loango and Black point, having a good sheltered roadstead within it of 4 to 6 fathoms.

The entrance of the river Loango bears S. by E. ½ E. (S. E. ½ S.) 17 miles from Black point; the coast between is covered with trees, and has a sandy beach, but it is not so elevated as that to the northward. Ten miles further is the river Kacongo, in which space the land rises into hills of moderate height. Three and a half leagues S. of Kacongo is MALEMBA, an open bay, surrounded with red hills, moderately high, but steep towards the beach. There is anchorage here in 6 or 5 fathoms, about a league from the east shore. The marks for the road are a small hillock which borders the shore, and a little rocky point extending into the sea, near which there is a ledge of rocks under water.

CABENDA BAY. Point Palma, or Cabenda hook, lies about 3½ leagues from Malemba, and forms a well sheltered bay; to enter which steer towards a great tree at the bottom of the bay, bringing it to bear S. E. by S.; by this you will avoid, and leave on the starboard side, the sand banks at the entrance of the river Belé, which are very dangerous, having breakers occasionally on them. Take care also to to give a berth to Cabenda hook, as it is bordered with shelves that stretch a mile to seaward. The anchorage is in 5 or 4 fathoms, with the hook bearing W. and W. by S., and the tree S. E. by S., distant two miles. Cabenda is sometimes called Two Hills' bay, from two hills that lie to the southward of it, and which may be descried at a distance as you approach it on the north.

RIVER ZAIRE, OR CONGO. Red point is distant 4 leagues from Cabenda hook, and has a reef around it that stretches 1½ mile into the sea. From this point to that of Palmeirinho, at the entrance of the river Congo, the bearing and distance is S. by E. ½ E. (S. E. ½ S.) 7½ leagues. Cape Padron is the westernmost point on the south side of the entrance. Further to the eastward is an obtuse projection, called Turtle corner; and 6 miles E. N. E. ½ E. (N. E. ½ E.) from the cape is Shark point, known by its thickly wooded hillocks; the land then bends to the S. W. to a shoal bay, called Diego's bay, and the coast afterwards takes an easterly direction. Between Shark's point and Boolambemba, or Fathomless point, the river is 2½ leagues wide, and they bear from each other about E. by S. and W. by N.: near the coast, on each side, are 5 to 7 fathoms, but in mid-channel there is no bottom to be found at 100 fathoms.

THE RIVER CONGO forms a most impetuous current at its mouth; and in order to avoid its influence, when coming from the south for Cabenda, you give the shore a berth of 1½ or 2 leagues in 10 fathoms. If you happen to be on the south side of the current, and night coming on, anchor to the S. W. of Cape Padron, about 2 leagues off the coast, and wait till the breeze shall be formed next day, as it would be hazardous to attempt the passage at night. The breeze commonly begins at 9 or 10 o'clock, and blows from S. S. W. to W. S. W. You direct the head of the ship from E. N. E. to N. E., to encounter the current in the most advantageous manner, and keep it so, till you begin to be in the bed or channel of the river, when you put the head to N. N. E., constantly using the lead in the mean time. The water runs with such force, that it will often carry the lead away, and it would be vain to attempt to moor, if you were caught there in a calm. Having past the current, you will find from 16 to 14 fathoms; you must then approach the land to within 8 to 6 fathoms, but get no nearer, as there are some sand-banks of only 15 or 16 feet water, which are to be avoided. As Cabenda hills come in view, steer N. E. towards them, but do not get into less shallow ground, for the reasons already stated.

The coast to the southward of the river Congo is known by its red cliffs, and the current generally sets towards them; the land within is flat, the shore clean, and you can safely anchor in 8 or 10 fathoms. Seven leagues from Cape Padron is Cape Engamas; and S. by E. ¼ E., 3 leagues from the latter, is Margate bluff. Here the coast rises considerably, and continues so for 10 leagues to Funta bay. Its north point has a reef that stretches 3 miles to the southward; the bay is about 4 miles wide, situated at the mouth of the river Lelunda, and affords good anchorage in 4 to 6 fathoms. To the south of Funta the land is low as far as the river Cousa, which is distant about 4 leagues, and may be known by the high trees at its north point. The coast is now well wooded, with a range of double land behind. Foreland bluff is distant 5 miles from the river Cousa, and 6 leagues further is a point, called Double-headed cliff, behind which, on an elevated spot, some distance inland, is a high pillar of granite, that may serve as a good mark for this part of the coast.

AMBRIZ BAY. The river Doce is distant about 4 miles to the north of Point Palma, which is the north extremity of Ambriz bay, distant about 5 leagues from Double-headed cliff. Palma may be known by a mount, called Aravat, standing to the N. E. of it; the south extremity of the bay is also distinguished by its close green wood, and, from the impetuous breaking of the sea, is named Strong-tide corner. Both points are foul, being encompassed by strong reefs, on which the sea breaks. In coming towards the bay from the northward, you may approach the coast in 8 or 7 fathoms; the anchorage is in 3½ or 4 fathoms, towards the north side, muddy bottom, distant about two miles from the factory houses, and here a good supply of wood and water may be obtained.

Nine miles S. ¼ E. (S. S. E. ¼ E.) from Strong-tide corner is Bamba mount, appearing like an island, to the south of which is the roadstead of Little Mazula, where you may anchor in 6 or 7 fathoms. Six leagues further South (S. S. E.) is Mazula bay, into which falls the river Onzo, running from the N. E.: off the mouth of this river is anchorage in 4 fathoms. The land between the two roads is rendered remarkable by the seven hills, which appear like islands standing close together on the sea-side. We now reach the river Dande, where there is anchorage in 6 to 8 fathoms. Dande point, on the south side of the entrance, is a high steep land, flat and barren, that comes down with a tail; within it mangroves will be seen, but towards the shore there are only red and white steep cliffs. At the mouth of the river you anchor in 8 or 6 fathoms, and all along the coast in 10 and 12, soft mud. The river is described as navigable for vessels drawing 12 feet, to some distance past the town, a place which has been the seat of an extensive trade with Brazil and the islands. The coast, 4 leagues to the southward of Dande point, is cliffy, and for 2 leagues further to Bengo river it is a low beach. Cape Lagostas, lying about 7 miles westward of the river, forms the S. W. point of Bengo bay; it is a high steep cliff, surmounted by trees which cover its summit; the land between it and the river is low, but rises towards the cape in white and red cliffs, forming a contrast with the low land that appears within to the south-eastward, when you approach from the N. W.

ST. PAUL DE LOANDO. This is a city of considerable extent, situated on the south shore of Bengo bay, and it is the chief settlement of the Portuguese on the coast of Angola, and the best place for a ship to obtain refreshments. The port is formed by a low narrow sandy island, 6½ miles in length from N. E. to S. W., and forms a bay with the coast where the town is situated, about 1½ mile broad, but so shallow that some parts dry at low water. About half a league S. W. of Cape Lagostas stands the cenotaph and fort of San Pedro; and about 4½ miles to the south-westward, on the west of the town, is the citadel of Fort San Miguel; about half a league from the latter, the depth in the harbour are 17, 16, and 12 fathoms, whence they suddenly shoalen to 2, and in some places only 1 fathom. The island of Loando is so low that it will not be perceived, though the land behind it may be distinctly seen. From its north end there is a hard sandy reef, about one mile broad, that extends two miles E. N. E. (N. E.) having in some parts only 12 feet water upon it. Cape Lagostas bearing S. E. by E. will lead clear of its north end, in 17 or 18 fathoms; and Bengo point brought a little open to the left of the cape, leads nearly a mile to the N. E. of the reef, and to the opening of the harbour.

On advancing from the northward for St. Paul de Loando, you may approach within half a mile of Cape Lagostas, on a south bearing; then steer towards mid-channel to the W. S. W., for the fort of San Miguel, keeping it a sail's breadth open to the southward of the north-eastern end of Loando island, and having got abreast of Fort St. Francisco, on the east of the town, anchor in 10 or 12 fathoms, good holding ground. Vessels should not venture to pass beyond this fort, as the water shoalens very quickly above it. Coming from the southward, keep well to the north of Loando island, until you open on a S. S. E. bearing, the bluff point in Bengo bay, within Cape Lagostas, which you may there steer for, rounding the reef, and proceeding for the anchorage as before directed.

CURIMBA COVE lies at the south end of Loando island, and is defended by a fort, within which there is an extensive lagoon, divided from the sea by a narrow neck of land. About 5 leagues to the S. W. of Curimba there is a sandy point, called Palmarinho, from which a sandy reef stretches off nearly two miles; to the southward of it lies Sleepers' bay, and beyond that is the river Coanzo, having an entrance half a league wide. This river is the southern boundary of Angola, and abreast of it you may anchor in 12 or 14 fathoms, 3 leagues from shore, or in 9 fathoms within a league of it. In Sleepers' bay there is anchorage in 6 to 9 fathoms, oozy ground, the marks for which is a grove of trees in the middle of it, along the side, and to the northward two hummocks appearing like paps.

CAPE LEDO bears S. by W. ½ W. (S. ½ E.) 10 leagues from the entrance of Coanza; it is a high rugged promontory, with straggling trees projecting into the sea. About 4 leagues to the northward of it, the coast chiefly appears all steep hills and verdant land; on the south side it is bordered by remarkable white cliffs. About 5 leagues S. ¼ W. (S. by E. ¾ E.) from Cape Ledo is Cape St. Bras; and 11 leagues to the south of the latter is Point Longo, at some distance to the south of which is a river of the same name. About 5 leagues to the southward of the river Longo is the Bight of Old Benguela, about two leagues wide, from the end of the cliffs to a projection called the Three points, at the mouth of the river Cuba. Point Morro is distant about 5 leagues from the Three points, and is a steep, black, rugged, stony point, and forms the north extremity of Bahia Longa, which lies between that point and Point Longo, 15 leagues to the south. Novo Redondo is situated in Bahia Longa, distant about 10 leagues from Morro point. There is anchorage here, near the shore, in 2 or 3 fathoms; and the settlement, which has been established by the Portuguese, is defended by a fort.

Seven leagues from Novo Redondo is Whale's head, or Muddy point, and beyond that is a projection called Green point. We next arrive at the small cove of Cotovelo, which affords well sheltered anchorage in 3 fathoms, muddy bottom, having 7 fathoms in the the entrance. Three leagues S. W. of Cotovelo is the river Cuvo, the northern boundary of Benguela; the north point of the river is known by a white cliff that looks like a fort, and to the S. E. of it is a remarkable sugar-loaf, 6 or 7 leagues inland. The river Catumbela is distant 5 leagues S. W. ¾ W. from the north point of Cuvo, and has anchorage before it, in 7, 6, 5, and 3 fathoms.

ST. PHILIP DE BENGUELA. This place is next in importance to that of St. Paul de Loando. About 4 miles to the S. W. of the river Catumbela is the N. E. point of Bahia das Vacas, or Cows' bay, at the bottom of which stands the town of St. Philip. The point has a spit of sand under water, that runs about three quarters of a mile north into the sea. Benguela bay is formed by a peninsula on the S. W. side, the extremity of which is called Point de Chapeo, from a remarkable single clump of trees, named St. Philip's bonnet. The two points of the bay extend from each other 7 or 8 miles, and it is about 2½ miles in depth. Midway between the two points are 17 fathoms, the depth of water gradually decreasing towards the shore, about three quarters of a mile from which are 6 fathoms. The water here is neither good nor easily procured, but all articles of provisions are plentiful, and abundance of fine fish may be caught in the bay.

H. M. S. Nereus lay in 10 fathoms, with the flagstaff in a line with the east side of the church, and this is considered the best anchorage. Another vessel moored in 10 fathoms, with the northern extreme of the land N. by W. ½ W., St. Philip's bonnet W. N. W. ¼ W., the flagstaff of the fort S. E. ¼ E., about 1½ mile from the shore: several vessels at the time were riding within in the road.

Salinas point bears W. S. W. ¼ W. 9½ leagues from St. Philip's bonnet, and extends a league and a half seaward, beyond the land to the southward, and has a reef about it. The Friar's rocks lie S. W. ¼ W. 7 leagues from it: these consist of three rocks lying off Francisco point, between which and Salinas point, to the northward, is situated the BAY OF ELEPHANTS, so named from the number of those animals seen there. The shore hereabout is bold, and there is good anchorage near it, in 10 or 12 fathoms. Cape St. Mary bears S. W. by W. (westerly) 5½ leagues from the Friar's, the land between forming a bay of the same name, the shore of which is steep, and the depth of water very great.

The coast, to the southward of Cape St. Mary, is high and steep towards the river Gubero, which is distant 9 leagues; it may be known by a round hill that lies about half-way between. We next reach the river St. Nicholas, 10 leagues more to the southward, rendered dangerous by a reef on the south side of the entrance, with breakers on it. Five leagues beyond St. Nicholas is Village bay, which is small, but the ground is good. To the southward of it, near the entrance of the river Ramos, stands a high mountain, called the Old Man, that serves as a good mark for the coast.

LITTLE FISH BAY. Cape Euspa is the north point of this bay, and lies about 12 leagues S. W. ½ S. (S. by W. ½ W.) from the Old Man mountain. There are two sandy coves between, separated from each other by Cape Gertruda, called Flies' and Turtle bays, in either of which there is anchorage. Point Annonciation, or Brown's point, forms the south extremity of Little Fish bay, and is distant about 2 leagues from Cape Euspa. Near it is a projecting head of sand, that extends to the N. W.; and here commences a range of hills and high cliffs, that extend 6 or 7 leagues to the entrance of the river Flamangos; and in this space stands Mount Negro, which may be seen at a considerable distance.

CAPE NEGRO. The bearing and distance from the south point of Little Fish bay to Cape Negro is S. W. ½ S. 10 leagues. This is a remarkable headland, distinguished by a pillar of alabaster, erected thereon by the Portuguese, on its first discovery in 1486; it is of a level, brown, sandy appearance, discernable at 7 leagues distance, were it not for the atmosphere being generally hazy, and owing to this circumstance it has been passed at less than half that distance without being seen.

PORT ALEXANDER. From Cape Negro to Port Alexander the distance is S. W. ½ S. 2½ leagues. This is a very safe harbour, affording excellent anchorage in 16 to 12 fathoms, but towards the N. W. the harbour is shallow; it is formed by a peninsula on the north, being a low sandy tongue of land. The outer point on the east is a high sand cliff, and the coast towards Cape Negro is of a similar description. From the outer point of Port Alexander, the bearing and distance to Great Fish bay are S. by W. ½ W. 14 leagues.

GREAT FISH BAY. This is a spacious and fine bay, formed by a narrow neck of land to the westward, called the Tiger peninsula; its entrance is to the northward, and above two leagues in breadth, getting still wider as you advance within it. You may round the N. W. point of the Tiger peninsula very close, in from 18 to 12 fathoms water, clear of any danger whatever. Within the harbour are from 20 to 5 fathoms; it appears safe and well sheltered, but it is little frequented, except by whalers, on account of there being no fresh water to be procured there: we apprehend, that by digging wells on the shore, this article might easily be obtained. To the southward of Great Fish bay, as far as latitude 31° S., the coast is a mere sandy desert, and said to be destitute of fresh water.

At some distance from the south point of Tiger peninsula, the land is bordered with downs and several slender bays, for a distance of nearly 20 leagues to Nourse river; it thence takes a S. W. and southerly direction, 25 leagues, to Cape Frio, on the north of which is a cove of the same name. Although the land, some few leagues to the northward of the cape, is tolerably high, yet in its immediate vicinity the shore is low and sandy, and continues so for several leagues to the southward. From Cape Negro to Cape Frio the soundings vary from 70 to 50 fathoms water, 7 or 8 miles from the land. Frio cove may be recognised by three hills, the middle one being higher than the other. The land from hence to the cape appears double; as you approach towards the latter, the coast is covered with trees, interspersed with numerous sand hills, and the depth of water is generally about from 15 to 20 fathoms, at one or two leagues distance. Nearly 70 leagues to the southward of Cape Frio is Cape Sierra, or Cape Cross; the coast between is very imperfectly known,—it is chiefly of a low sandy nature, rising into high land towards the interior. The depth of water near the shore varies from 10 to 15 and 20 fathoms.

WALWICH BAY is spacious, and well sheltered, except from northerly winds, which seldom blow here. There is a safe harbour, forming the south part of it, the entrance to which bears S. ½ E. (S.S.E. ½ E.) 23 leagues from Cape Sierra. Its western side forms a peninsula, 4 miles in length, terminating at the north, at Pelican point, where its entrance is about 3½ miles wide: the soundings round the shore regularly vary from 3 to 6 and 7 fathoms. The bay may be known by a remarkable hill to the northward of it, with several sharp peaks to the top, which incline towards the N. E. About 4 leagues to the northward of Walwich bay is a newly discovered river, named Somerset.

SANDWICH HARBOUR, or PORT D' ILHEO, lies 13 leagues to the southward of Walwich bay. The outward point of the harbour, in which are only 3 fathoms water, stretches some distance into the sea, and is encompassed by reefs.

THE ALLIGATOR ROCKS lie in latitude 24° 38′ S., and consist of a reef, lying about 6 leagues from the shore, with breakers running to the southeastward full two leagues. *Hollam, or Bird Island*, lies in about the same parallel, a league and a half distant from the land.

SPENCER'S BAY. This is sheltered to the westward by a small island, called Mercury, and a rock at its north end; yet it is more exposed than either of the bays we have already described on this desert coast. The best anchorage appears to be behind Mercury island, in 6 or 7 fathoms; the southern shore is rocky, while a considerable surf beats continually on the sandy beach, which forms the eastern side of the bay: it is but little frequented. The coast hereabout is a sandy beach, having no appearance of water or vegetation; the interior exhibits high sand hills, but does not appear to be inhabited; lions and other wild animals seem numerous.

ANGRA PEQUENA is a narrow inlet of the sea, running in to the eastward of a rocky promontory; its depth is about two leagues, having

6, 5, 4, 3, and 2 fathoms water: this part is well sheltered from all winds. On its eastern side is a small cove, with a sandy beach for boats to land at, if necessary; and at the southern part of the harbour is a sandy plain, the soundings lessening gradually as you approach towards it. There are three small islands to the northward of Angra Pequena, called Seal, Penguin, and Shark islands; these are surrounded with rocks, but have passages between, and an excellent harbour within them, in which are 3 to 5 fathoms. A dangerous shoal is said to lie 11 miles from the shore of Angra Pequena.

ELIZABETH BAY. This slender bay lies about 5 leagues to the southward of Angra Pequena, and is formed by a narrow semicircular island, between 2 or 3 miles distant from the main, called Possession island, within which vessels may ride either close to the island, in 3, 4, or 5 fathoms, or midway between, in 10 or 11 fathoms, the island affording shelter from the West and S. W. At the north end of Possession island are some rocky islets, having 11 fathoms water near them; and at the south end there is a rocky reef, with 9 fathoms at its extremity: there is a safe landing for boats on the main. Tides rise, on the full and change of the moon, in Elizabeth bay, about 6 feet. About 22 leagues to the southward of Elizabeth bay is Angra Juntas, or Narmaquas bay, with an island at its entrance. The coast hereabout, or indeed all the way between, is rocky, and destitute of water and vegetation.

CAPE VOLTAS is about 22 leagues from Angra Juntas, and forms the south point of Orange, or Giarep river, the mouth of which is half a mile wide, but much encumbered with rocks, extending in an east and west direction a mile from shore. An extensive reef projects from the cape, and there are several small islands to the southward of it. On this side the coast is low and sandy, but towards the northward it is more elevated.

The coast to the southward of Cape Voltas presents an appearance of barren sandy plains, without water, until you reach the river Koussie, which forms the N. W. boundary of the Colony of the Cape. Nearly 13 leagues further is Zwaitlinje river. Then follow the rivers Groerne and Zwarte Darn; and about 8 leagues from the latter is the mouth of the river Oliphant, or Elephant, the entrance to which is rocky, shallow, and contracted. Donkin's bay lies about 4 leagues to the southward of Elephant river, and 3 leagues beyond that is a small sandy cove, called Lambert's cove.

ST. HELEN, OR HELENA BAY. About 5 leagues south of Lambert's is a high bluff headland, called Cape Deseada; and between that and Paternoster, or St. Martin's point, 10 leagues to the south-eastward, is situated St. Helen's bay. There are regular soundings in the bay, of 12 to 10 fathoms, decreasing towards the shore to 6 and 4 fathoms; but it is bordered by a reef on the western side, that extends all the way to Berg river, an inconsiderable stream falling into the bottom of the bay. The anchorage in St. Helen's bay is safe in summer, when southerly winds are prevalent; but in winter, when it blows from the North and N. W. quarters, it is not to be recommended. It is high water here, at the full and change, at half-past two o'clock. St. Martin's point is low; a rock is said to lie 3 leagues to the southward of it, about 4 miles from land.

SALDANHA BAY is situated about 7 leagues south of the former; the coast between is broken and rugged, indented by several small coves, and must be given a wide berth, as some rocks lie a considerable distance from it. Saldanha is a spacious, secure, and excellent harbour; its entrance is in latitude 33° 6′ S.; there can be no difficulty in running for it, if you are assured of your proper latitude. At its mouth are the islands of Jutten and Malagen, or Malagassen; these are both low, and require a person to be placed at the mast-head to discover them; they lie nearly N. W. and S. E. of each other, and the channel between them has from 13 to 24 fathoms water. It is said there is also a passage between Jutten island and the main, with from 7 to 11 fathoms water in it, and that both sides may be safely approached within 100 yards distance; but that you should anchor at twice that distance off, or you will have foul ground. Between Malagassen and the main there is also a channel, with from 20 to 10 fathoms, but foul and dangerous; some rocks likewise lie off the N. W. of this island. Further in is the island Mascus, a flat naked rock, with a passage on either side of it; this you may approach to about a cable's length, into 6 and 7 fathoms water, but not nearer. The southern channel is the wider of the two, and preferable with a southerly wind; for if desirous of anchoring to the southward, in order to avail yourself of a S. Easter, to go out, you will be able to reach your anchorage; or if you wish to run into Hoetjes bay, you will have time enough to take in sail before you anchor.

Hoetjes Bay is that part which forms the northern part of Saldanha bay, and affords anchorage in 6 fathoms water, with the granite pier in one with Mascus island bearing S. by W., where you will ride land-locked, and sheltered from all winds. About a cable's length from the northern point of land which forms Hoetjes bay, is a rock which dries at low water, spring tides. There is also another rock, called the Blinder Klip, which has only 3 feet water over it at low water, and is not visible unless the wind blows strong enough to cause a rippling: the mark for this rock is Mascus island and the Mouse's back (a hill on the northern shore) in one. The western shore of Hoetjes bay is skirted by a range of rocks, having 4 fathoms water close to them; the starboard shore is bold-to in working up to the head of Saldanha bay, until you are about 1½ mile from Sheep island, where a triangularly-formed bank begins and terminates at Salamander point, the soundings over which are from 5 to 3 fathoms; the depth is regular on the starboard side, from 3½ and 3 fathoms, till within half a mile of the beach. Near Scapen, or Sheep island, is another small island, having shoal water off it, and the depths very irregular; about a mile off it are 2½ fathoms, and in some parts are only 6 and 7 feet. Between this and the eastern shore, the channel continues good as far as Melvill's, or the Old Port house, up the Lagoon. In working up to Sheep's island, you ought to keep your lead going constantly, for the the soundings to the N. Eastward are regular; but in standing back S. Westward, endeavour to get the north end of Sheep island in one with Saddle hill, then put about, for the water shoals directly afterwards.

There is a place called Bavian's Bay, situated at the back of, or between Mascus island and the main, where vessels may ride sheltered from the N. W. winds; but the ground is foul, and Hoetjes bay will always be found more convenient, as ships may work out from that place at all times. Cattle and provisions are commonly plentiful and reasonable, and fish may be netted in abundance in Riet's bay or cove, or with the hook and line at every other part of the bay. This is also an excellent place for repairing or even building vessels, but the greatest inconvenience attending, is the want of wood and fresh water.

DASSEN OR CONEY ISLAND is a low flat island, lying 7 leagues to the southward of Saldanha bay, and 5 miles from the land; it is the resort of innumerable penguins and rabbits. Its S. and W. sides are rocky, with breakers that extend half a league into the sea; there is anchorage, however, on the east side in 16 fathoms, about a gun-shot from the shore, bottom of white sand.

ROBBEN, OR PENGUIN ISLAND, lies 24 miles S. ¼ E. (S. S. E. ¾ E.) of Dassen island; it is low and flat, about two miles long, and one mile broad, being 3½ miles off the main, and 4½ miles to the northward of Green point, and is surrounded by rocky ground. One mile distant from its southern extremity is a sunken rock, called the Whale, over which the sea breaks when there is any swell, but at other times the water flows smoothly over it.

Should a ship, in making for Table bay, be driven to the northward of Dassen island, by the southern winds, the soundings will be a good and safe guide to approach the land by, for between Saldanha and Table bay the depths are regular, and the soundings extend several leagues from the land. From Dassen island to Robben island the depth of water is from 50 to 60 fathoms, at 5 miles from the shore, and 3 miles from the land there are from 20 to 22 fathoms; about 10 miles N. W. of Robben island are 30 fathoms, and 40 miles from Cape Town, in the parallel of 33° 30′, there are 110 fathoms.

CAPE OF GOOD HOPE, one of the most southern parts of Africa, was discovered by Bartholomew Dias, the Portuguese navigator, in 1493. Dias, after exploring the Atlantic coast of Africa, as far as Cape das Voltas, 29° S. latitude, was driven out to sea by a storm, and the next land he saw was Algoa bay. He had thus doubled the south extremity of Africa, without knowing it. On his way back he saw the cape, since called the Cape of Good Hope, to which he gave the name of Cabo Tormentosa, or Cape of Storms. On his return home, the King of Portugal gave it the name of Cape of Good Hope, as an omen that the Portuguese had now a fair prospect of reaching India, the great object of their maritime expeditions.

TABLE BAY is situated to the north-eastward of that promontory which stretches towards the Cape of Good Hope, and is easily known by the high mountains which are contiguous, and which, seen at any considerable distance, have the appearance of an island. The highest of these is at the south part of the bay, and known by the name of the Table mountain, being 3,582 feet above the level of the sea, flat at top, and sloping almost perpendicularly down at its eastern end, where it is joined to a rugged peaked mountain, called the Devil's hill, nearly equal in height, the division forming an apparent gap or chasm between. Table mountain falls down also to the westward, in a similar steep and sudden manner, from its summit to a considerable distance, the further declivity being abrupt, until it joins the foot of Sugar-loaf, or Lion's head, a mountain whose elevation is 2,160 feet: this is joined on the northward by an oblong hill, 1,000 feet high, and called the Lion's rump. On the top of the Lion's head a flag is displayed whenever any vessel appears in the offing, and near the summit is a spring of good water. The Table mountain, Devil's hill, and Lion's head, make in fact but one mountain, for, though disjointed at their summits, they unite at a very considerable height above their base; the Devil's hill appears broken into angular ragged points, while the Lion's head is rounded similar to a dome, and looks like a work of art.

CAPE TOWN is situated in the S. E. part of Table bay, and built upon a shelving plain, which gradually rises to the foot of the Devil's hill, the Table mountain, and Lion's head; the last of which stretches out to the northward, and shelters the bay from the westerly winds. The town is defended by numerous forts and batteries, and all kinds of refreshments can be readily procured for shipping, on reasonable terms; water is plentifully supplied at the pier, being conveyed there in pipes, and commodiously calculated for the accommodation of the boats.

Table Bay affords an excellent and secure place for shipping in the summer months, when the S. E. winds prevail; but when N. W. winds come on, vessels commonly are obliged to stretch round to the eastward of the cape, and take shelter in Simon's bay. Ships bound to Table bay should endeavour to make the land to the southward of it, on account of the southerly winds and northerly currents which frequently prevail there: many, for want of this precaution, have fallen in with Dassen, or Coney island, or further to the northward.

All vessels going to Table bay should pass between Robben island and Green point, while those bound from thence may go the northward of the island; for the strong S. E. winds produce a favourable current between that island and the northern shore, while that between Robben island and Green point will be running into the bay; the ground between these latter is foul. Vessels coming in from the southward may, as they advance, come within 1½ mile of the shore, which is bold, and they will have at that distance 50 and 60 fathoms water; but Green point may be approached to the depth of 10, 9, or 8 fathoms, without danger; they may then steer towards the shipping in the road, in 8, 7, or 6 fathoms, regular soundings. The proper anchorage in the bay is abreast of the town, on a sandy bottom. In the summer months a ship may moor in 7, 6, or 5 fathoms, with Green point bearing N. W. ½ N. (by compass) the bottom of Table mountain, S. W. ¼ S., the flagstaff on the Lion's rump, W. ½ S., and the house of Penguin island, N. ½ W., at the distance of half to one mile from shore, and from one to one and a half mile from the town. When N. W. winds are expected, ships should not anchor in less than 6½ or 6 fathoms, because the swell runs more regular than in shoal water, and at these times they should ride with a whole cable or more, lest they should drive, in which case it would be difficult to bring them up again. The best ground is in from 5 to 7½ fathoms; further out, with the Lion's head in one with, or open to, the northward of the Lion's rump, the ground is rocky all across the bay.

The prevailing winds, near the cape and in Table bay, are from the S. E. and Southward, during the summer, that is from October to April, the S. E. winds blowing more or less in every month of the year, and generally bringing settled weather. N. E. winds are less frequent than any, and never continue long. The S. E. winds extend more than 200 leagues to the eastward of the cape. In May, June, July, and August, the S. W. and West winds blow strong, and are often attended with fogs and cloudy weather; but the N. W. winds are most violent in these months, and frequently continue blowing for several days together, with a clouded sky, accompanied at times with lightning and showers of hail or rain. These winds extend to 27° S., and to a considerable distance Westward. The summer continues from October to April, during which season it has been thought safe for ships to lie in Table bay. The N. W. gales are occasionally experienced about the cape in every month in the year, but they seldom blow home in Table bay during the summer months, although there are instances of ships having been driven on shore by them in April. The Dutch commonly fixed on the 10th of May as the period for ships to leave this place, and never suffered them to remain there after that time, on account of the approaching season, when N. W. gales were expected to set in, which blow so violently, and raise such a mountainous sea, that it is almost impossible for any ship to ride at her anchors.

In the fair weather season regular sea-breezes from S. W. and West prevail in the mornings, and continue until noon, sometimes longer; they are then succeeded by S. E. or E. S. E. winds from the land, which generally blow fresh during the remaining part of the day, and frequently until the following morning, when the sea-breeze returns again. Whenever the Table land in the summer months begins to be clouded, it indicates a strong E. S. E. or S. E. wind, which, soon after it is clouded over, comes on, and blows excessively hard, sometimes for two or three days, particularly in January, February, and March. With these winds ships frequently part their cables, or bring both anchors ahead; therefore ships ought to moor with good cables; and it is usual, as soon as moored into this bay, to strike yards and topmasts, and make all as snug as possible. When the Table land is free from clouds, the south-easter will be moderate. It is high water in Table bay at half after 2, full and change, and the tides seldom rise above 5 feet.

The preceding were the directions given previous to the erection of the LIGHT-HOUSE on Green point, in 1825, since which the following has been made public :—

Cape Town, 1*st March*, 1842.

INSTRUCTIONS FOR ENTERING TABLE BAY BY NIGHT, by the plan constructed on the observations made by H. M. S. Leven, November, 1825. The bearings mentioned in these instructions are all by compass or magnetic :—

1. To enter Table bay from the northward, meaning to pass outside of Robben island, a ship should keep the light to the eastward of south, 9° E., or about S. by E., until she get soundings under 20 fathoms, at a little more than a mile from the light-house; she may then steer E. S. E. or E. by S., not to come under 10 or 12 fathoms, until the light bear W. S. W.; she may then steer for the anchorage, and may anchor in from 7 to 6 fathoms, as soon as the lights are shutting in behind the Lion's tail. This track leads about a mile clear of danger on Green point; but a ship need not approach it so near, if she have, by seeing Robben island, ascertained by its bearings that she is clear of the Whale rock, in which case she may round it at a greater distance from Green point, if desirable, but the soundings in that case will not alone be a sure guide.

2. In coming from the S. W., a ship should not get less than 40 fathoms before the light bears S. E. or E. S. E., nor less than 20 fathoms before it bears S. by E., when the preceding directions may be followed.

From the northward (inside of Robben island) the light should be kept about S. W. by S., until a ship have passed that island; in doing which she may have some casts from 8 to 6 fathoms; and when on that course the water deepens to 10 or 12 fathoms, she may steer for the anchorage by the plan as before directed. In beating round Green point, a ship should never shoal her water under 11 or 12 fathoms, until she have brought the light to bear W. S. W., as before said. In beating between Robben island and the main, to enter Table bay, the soundings may be taken from the island, as it shoals-to very regularly. In standing towards the main, it appears prudent to tack at the first cast of the lead after the water shoalens. In these directions it is taken for granted, that a ship will always keep her leads going. By day, or when the shores or surf can be seen, or indeed under any circumstances, the plan ought to be a sufficient guide.

There are two lights at the light-house, which are in one about S. W. by W.; these appear to be of no other use than to assure the navigator which is the light-house, if he should see other lights. We have seen the lights clearly off deck at 16 miles distance, but they will not make clear as two lights until within 6 or 7 miles to the westward of them, and from the northward one light only will be seen.

(Signed) W. F. OWEN,
Captain of H. M. S. Leven.

A light having been erected on the Mouille point, with a lenticular light of the 4th class, for the better guidance of vessels entering Table bay during the night, the following instructions are appended to the instructions by Captain Owen, R. N.

In standing in from the S. W., a ship should not pass the lights on Green point nearer than a mile; nor should the course be altered from the eastward to the southward, with the intention of steering for the anchorages; nor should the ship be brought into less than 14 or 15 fathoms water, before the lights on Green point bear S. W. by W. ½ W., (they will then be in one) when the light on the Mouille point will instantly be seen, (and not before) bearing nearly S. by W. A ship may then alter the course from the eastward, and steer S. S. E. for the centre of the anchorages, and anchor whenever the lights on Green point are shut in, (by sand-hills near the Mouille) and the light on the Mouille point bears N. W., distant about a mile, in from 6 to 8 fathoms water. Vessels of light draught of water may steer S. by E. ½ E. for the anchorage, and anchor with the Mouille light bearing N. W. by N., in from 4 to 5 fathoms of water.

The ship's distance from the shore, when the light on the Mouille appears, may be readily ascertained by the bearings of the two light-houses, and the distance between them, which is 1,215 yards; the perpendicular height of the Mouille light, above high-water mark, is 40 feet.

In coming in from the northward, (inside Robben island) the lights on Green point will appear in one, (or nearly so) and the light on the Mouille point will also be seen, the distance between the light-houses being as above-mentioned. The directions by Captain Owen, and the appended directions, will be a sufficient guide to the anchorage.

It is earnestly recommended to strangers not to attempt to beat into Table bay at night, in squally or thick weather. The strictest attention should he paid to the soundings, and the leads kept constantly going. The plan of the bay, by Captain Owen, (upon which the instructions are founded) should also be at hand for reference.

(Signed) J. Bance, *Port Captain.*

By command of his Excellency Sir G. T. Napier, K. C. B., Governor, Vice Admiral, and Commander-in-Chief of the Colony of the Cape of Good Hope, and its Dependencies, &c.

(Signed) J. Moore Craig,
Acting Secretary to Government.

N. B.—The light on the Mouille point will be lighted from and after the 1st day of July next. *(Copied from the Nautical Magazine for* 1842, *page* 495.*)*

Table Bay to False Bay. About 3 miles to the southward of the light-house on Green point, lying half a mile from land, off the Sugar-loaf or Lion's head, lie two clusters of rocks, called the Lion's paws; and 7 miles further is a remarkable projection of rocks, extending from the shore, near the promontory of Chapman's head; indeed the whole of the coast hereabout is encumbered with rocks and foul ground. To the eastward of Chapman's head is Hout Bay, a snug little cove, where shelter may occasionally be found. The entrance is about a mile and a quarter broad, and has a depth of 18 to 12 fathoms, but rather open to the S. W. You enter along the eastern shore, which is very high and rugged, and quite inaccessible; and having passed the middle of the entrance, luff up under the west point, and there anchor. The summit of a remarkable peak, upwards of 3,000 feet in height, seen over high cliffs, brought to bear E. ½ S. (E. N. E.) will lead directly to the bay. On the west point, called York point, there is a battery, and on the opposite side there is another, and a block-house. About 2 miles to the westward of Hout bay, three-quarters of a mile from land, is a rock above water, called the Vulcan; within it is a bank of breakers, called Duyker's isle and shoal.

About 5 miles to the southward of Hout bay is Snake's head, or Slang Kop point; the coast between forms Chapman's bay, but it is wholly encumbered with rocks, and continues so from Snake's head to the SOUTHERNMOST EXTREMITY of the CAPE OF GOOD HOPE. This is a high precipitous cliff, with a peak 1000 feet in height; it lies in latitude 34° 22′ S., and longitude 18° 24½′ E., and has a reef extending nearly a mile to the westward. About a mile eastward of the cape is a small rock above water, called *Dias Rock*, lying a cable's length from shore. The *Bellows* is a large rock, even with the water's edge, over which the sea constantly breaks; it lies with the south pitch of the cape bearing North (N. N. W. ½ W.) distant 2 miles, and Muisingberg mountain, in N. W. corner of False bay, shut in with the cape point. The *Anvil* is another rock, separated from the Bellows by a safe channel (which, however, it may not be wise to attempt) of 10 fathoms; it has 10 feet water over it, and lies with the Cape point bearing N. N. W. (N. W. ½ W.) distant one mile and a half; the Bellows W. ¾ S. 2 miles; and the Devil's peak, in Table bay, just open of Muisingberg mountain. A master of the navy has asserted, with evident probability, that there are other rocks near the Anvil, but we have no particulars respecting them.

FALSE BAY. The entrance to False bay is formed by the Cape of Good Hope on the west side, and Cape False to the eastward; the latter is a steep bluff, resembling a quoin, which may be seen 8 leagues distant, appearing to lean over to the west, when viewed from the southward; it is often called Hangklip, and sometimes Hottentot's point; the distance between the two capes is about 16 miles. Across the entrance of False bay the depths of water are from 40 to 50 fathoms; but a little to the westward of the middle of the entrance there is a bank of rocky ground, called Whittle's bank, with soundings on it from 15 to 30 fathoms, having 45 to 50 fathoms within it, and 50 to 60 fathoms to the southward.

The middle and eastern parts of False bay are free from dangers, but the ground is foul and unfit for anchorage. On the western side, at 4 miles from shore, is the TRIDENT ROCK, having only 12 feet over it. This rock is about 20 feet long, and 10 broad; but there is a rocky bank surrounding it, of uneven soundings, and two cables' length in diameter, having from 5 to 15 fathoms of water. The Trident is steepest on the S. E. side. At 40 fathoms south of it is the *Whittle Rock*, of 4½ fathoms; and there are several rocks at about a cable's length to the N. W., having 4 and 5 fathoms. From the Trident Rock, the Cape point of Good Hope bears S. W. ½ W., 7¼ miles; the north point of Little Smith's Winkel bay N. W. by W. ½ W. (West) 4 miles; and Noah's Ark, on the south side of Simon's bay, N. W. by N. 6 miles.

As you enter False bay from the southward, you will perceive a ridge of rugged hills to the northward, which continue as far as Table bay, and in clear weather the Table mountain may be seen 20 leagues, but quite distinct within the entrance. On coming in from the westward, with a N. W. wind, a ship may pass to the southward and eastward of the Bellows and Anvil, at the distance of two miles, or according to circumstances. From abreast of the Bellows, at 2 or 3 miles, haul up no higher than E. S. E., or E. by S., until you have run 5 or 6 miles in this direction, whence you may steer to the E. N. E. and N. E., till the cape bears W. N. W., and you will be clear of the sunken rocks. In advancing thus, you may always gain a proper anchoring-ground, in case of a calm, or an unforeseen shifting of the wind.

SIMON'S BAY is situated about 11 miles to the northward of the Cape point, near the N. W. corner of False bay, at the foot of the highest mountain on the coast. From April to September, when Table bay is unsafe, ships put in here, as it is considered secure in all seasons; for, although it is open to N. E. and Easterly winds, they never blow sufficiently strong to cause any apprehension of danger. Cape Town is distant about 6 leagues from Simon's bay, and provisions and refreshments of every description may easily be procured; the water is also good and abundant. At a small distance from the south side of Simon's bay lies a small islet or rock, in form of a barn, called, from its appearance, *Noah's Ark;* about three-quarters of a mile to the N. E. of it is a small reef, at the water's edge, called the Dispatch rock (commonly called the Roman rock*); and between them is the channel into the bay.

SEAL ISLAND lies about 2 leagues E. ½ S. (E. N. E.) of the Roman rocks, and is surrounded by numerous straggling rocks, some above, and others under water; they extend 2 or 3 miles to the southward, and nearly 4 miles to the eastward, and may be frequently seen by breakers on them when the sea runs high; vessels should therefore be careful of them, when turning to windward.

As you approach Simon's bay, Noah's Ark will soon be discerned: it is a smooth level island, appearing like a pontoon at a distance; but the most conspicuous object, and first to be seen, are those white sand-downs, appearing like snow, in the hollows between the mountains to the N. W. of Noah's Ark. You may coast along Noah's Ark, as it is steep-to, and has 9 fathoms close to it; in the channel between it and the Roman rocks are 10 to 15 fathoms; from hence a vessel should steer direct for the white sand-downs to the anchorage. If working with a N. W. wind, you may go to the northward of the Roman rocks, taking care not to go too near them, as a detached rock of 3 or 4 fathoms is said to lie on that side. This is also a clear channel, and may indeed be deemed more convenient with the winds from the N. W., as it is double the width of that between the rocks and Noah's Ark.

Ships may pass to the eastward of the Whittle and Trident rocks, between them and the reefs, to the southward of Seal island, though the western channel is undoubtedly to be recommended to strangers. Should you, however, wish to adopt the former, do not bring the Cape point to the southward of S. W. by W., until Noah's Ark bears N. W. by W., but when on the starboard tack, nothing to the northward of this bearing; you will then go clear of the Whittle rock. Do not go too near Seal island, on account of the rocky patch which lies to the southward of the island, over which the sea will oftentimes break. The anchorage in Simon's bay holds well, being sand and clay: it is here high water at half-after 3 o'clock, full and change, and the rise of tide is seldom more than 3 feet, with very little current at any time.

Simon's Bay may be considered a safe retreat for thirteen or fourteen sail of ships, where they will be moored in security at all seasons, but, being small, it cannot contain a numerous fleet, sheltered from S. E. winds.

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* By a notice, dated Cape of Good Hope, 22nd April, 1843, signed H. G. Dunsterville, *Harbour-master*, it appears that a beacon has been placed to point out the position of the above rock. It is a black spar, with a red board across the top, and the words "Roman rock" painted on it; and floats about 7 feet above the surface, and nearly upright. As it is moored some distance, say 40 fathoms, inside, or western extremity of the rock, it leaves between the beacon and the shore a safe and commodious passage; but any vessel passing in the outside, or eastward of the beacon, is particularly recommended not to approach nearer the beacon than three-quarters of a mile.

The best situation to lie in, is to bring Noah's ark and False cape in one, bearing S. S. E. ½ E. (S. E. by E.), the Roman rocks S. E. ½ E., distant 2 miles, and the south or east point of the bay S. S. E. ½ E. (S. E. by E.) In this berth, you will be distant about one mile from the shore, and well sheltered from all quarters. If bound to the eastward out of Simon's bay, leave it as soon as the north-westerly winds begin to blow; but if you intend to sail to the westward, you must wait till the north-westerly winds are on their decline, and get under sail on the road, so soon as those winds shift from W. N. W. to West, for, as they most commonly veer from thence successively to S. W., South, and S. E., they will prove fair for doubling the Cape of Good Hope, and lying up afterwards to N. W. The only directions to be given for leaving the bay is to reverse those for entering it.

Gordon's Bay is situated to the N. E. of False bay, and affords good shelter from S. E. and Northerly winds, and has several fair landing-places, from half-flood to half-ebb, but at no other time of the tide, excepting at the bar, which is formed by a bank of sand, and cannot damage the bottom of the boat: this bank has generally about two feet water over it, but at low water, spring tides, it is perfectly dry. The other landing-places are shewn on the chart, and with S. E. winds are smooth; but you must always be attentive to the tide. Within the lower dotted line on the chart is good anchoring ground, holding well, being of course brown sand; here vessels may anchor in from 13 to 15 fathoms, with the peak of Hangklip just open to the southward of the south point of Gordon's bay, and with the upper farm-house open to the left of the lower farm-house; small vessels may ride further in, where the inner anchor is placed in good security, the capes being completely shut in,—Gordon's bay south point effectually keeping off the sea. To ships working out of Simon's bay, Gordon's bay will afford ready shelter on the approach of night, for they can stretch into the outer part of it, and anchor for the night, well in shore, with a kedge or stream anchor; for it is generally observed, that when the wind blows strong from the S. E. at the anchorage in Simon's bay, and other parts of False bay, a ship will not have advanced half a mile within Gordon's outer bluff before she will get into a light breeze, scarcely sufficient to carry her to the anchorage: here she may lie until daylight; then weighing and stretching out into the true wind, and work out either round the Cape of Good Hope, or Cape Hangklip.

Gordon's bay will prove equally safe and advantageous for vessels standing in for Simon's bay late in the evening, and not considering it safe to run for anchorage there; for then they may stand over for Gordon's bay, and anchor for the night: they cannot mistake it, the land in the front, when standing to the eastward, being so very remarkable. This might easily be made a good place for shipping, for on each side of the bar are rocks, with plenty of large loose stones about them, and by piling up these stones upon the rocks, a pier might be constructed to any distance out; and if a swinging crane was erected on the south pier, it would considerably facilitate the lading and unlading of the boats. The same plan might be pursued with the bay northward of the fort. All the landing-places afford plenty of water, running down in streams, but the best is near the fish-house: here, although the passage is difficult and intricate, it has a spacious beach, well defended from the sea, by reefs running in opposite directions, the only obstacle being the delay for the tide. Fruits, vegetables, and stock can be had here, but not expeditiously, as it must be brought from a considerable distance.

The whole eastern coast of False bay, from Gordon's bay to Cape

Hangklip, wears a dismal inhospitable appearance; it is one continual rocky chain, and scarcely approachable. Colebrook bay, so named in consequence of the wreck of the Colebrook, is to the southward of Gordon's bay; and further southward is Pringle's bay, where Admiral Pringle is said to have landed.

From October to April, though south-easterly winds commonly prevail, yet they seldom continue longer than 5 or 6 days at a time, being constantly succeeded by winds that are variable; it therefore sometimes happens that these winds, after blowing strong for the day and night, will cease towards morning, and be followed by a breeze from the W. N. W. If this temporary change can be taken advantage of, a ship may, by weighing directly it comes on, get out to sea before the south-easterly wind returns again; but should she be unable to clear out of the bay, it will be prudent to return again to the anchorage in Simon's bay.

The Cape of Good Hope is frequently the boundary of different weathers; homeward-bound vessels very often experience variable winds and cloudy weather to the eastward of the Cape; while to the westward of the Cape, there will be settled weather, and a steady south-easterly wind, particularly in the summer season.

TIDES. It is high water, on the full and change of the moon, at Benin river, at 6 o'clock; Rough corner, at the entrance of New Calabar, at 5: tides rise 9 feet. At the entrance of Old Calabar, at 6: rise 6 feet. Cape St. John and entrance of the river Gaboon, at 5: rise 7 feet. Off the Calabar and Bonny rivers, the tide flows in the stream, or offing, till 6 hours. Corisco bay at 5 o'clock: rise 7 feet. George bay, in Fernando Po, at half-past 4: rise between 7 and 8 feet. Clarence cove at 4: rise 7 feet. At Prince's island the tide rises and falls from 4 to 7 feet. It is high water at St. Paul de Loando, at half-past 4: tides rise 5 feet. In the mouth of the river Coanza the rise is 8 feet; Walwich bay at 2 o'clock. Springs rise at Angra Pequena between 7 and 8 feet; at Elizabeth bay 6 feet. It is high water at St. Helen's bay at half-past 2: Saldanha bay at 2: rise 6 to 7 feet. At Table bay at 20 minutes after 2: rise about 5 feet. At Simon's bay, half-past 3: rise 3 feet.

The VARIATION on the COAST OF AFRICA is as follows:—New Calabar river, 20° 7′ W.; Old Calabar, 20° 3′; Fernando Po, 23°; Corisco bay, 20° 30′; Cape Lopez, 21°; River Congo, 21° 42′; St. Paul de Loando, 20°; Cape Negro, 23°; Walwich bay, 23°; Cape Frio, 24°; Angra Pequena, 26°; St. Helen's bay, 28°; Table bay, 28°.

SECTION VII.

ISLANDS, ROCKS, AND DANGERS, IN THE SOUTH ATLANTIC OCEAN.

☞ *The Notes referred to will be found subjoined.*

NAMES.	SOUTH LAT.		WEST LONG.		REMARKS.
	DEG.	MIN.	DEG.	MIN.	
Silhouette Vigia,......	0	20	20	50	A dangerous shoal. *Vide Note* 1.
Aquila Reef,...........	0	22	21	6	Supposed to be the above. *Note* 2.
Bouvet Sandy Island,	0	23	19	10	Seen in 1761. *Note* 3.
Triton Bank,...........	0	32	17	46	Passed over by the ship Triton, in 1816. *Vide Note* 4.
Shoal of Manoel Luis,	0	52	44	15	A cluster of conical rocks. *Note* 5.
Crown Reef,...........	0	57	23	19	Barque Crown, 1835. *Note* 6.
Prince's Shoal,.........	1	35	17	50	Ship Le Prince, 1747. *Note* 7.
Submarine Volcano,...	2	30	20	44	Seen in 1806. *Vide Note* 8.
Fernando de Noronha, *the Pyramid*,..	3	50	32	25½	A remarkable island. *Note* 9.
The Roccas,...........	3	55	33	43	Low sandy island. *Note* 10.
Ascension Island, *the Barrack*,......	7	55½	14	25½	*Vide Note* 11.
St. Helena, *the Observatory*,.........	15	55	5	42½	The sequestered spot to which Bonaparte was consigned as an exile. *Note* 12.
Bank of Antonio Viana	17	30	8	15	A dangerous shoal. *Note* 13.
Martin Vas Rocks, *the Central*,........	20	28	28	41	Three high and barren islands. *Vide Note* 14.
Congress Bank,........	20	30	37	30	A bank of soundings. *Note* 15.
Isle of Trinidad,........	20	31	29	21	A high and uneven island. *Note* 16.
Island Ascensao,.......	20	36	34	34	Doubtful. *Note* 17.
Columbus, or Saxemburgh Island,..	30	18	28	20	Very doubtful. *Note* 18.
Grant Breakers,........	31	33	11	30	Position not accurately ascertained. *Note* 19.
Laurel Shoal,...........	36	28	51	30	Discovered in 1822. *Note* 20.
Trista da Cunha, *the Waterfall*,.........	37	6	12	3	A circular island, terminating in a peak. *Note* 21.
Inaccessible Island; *Centre*,............	37	19	12	23	On which the Blenden Hall was wrecked, in 1821. *Note* 22.
Lennon's Reef,.........	37	31	4	42	Seen in 1817. *Vide Note* 23.
Robson Reef,...........	37	35	7	30	Doubtful. *Note* 24.
Telemaque Rock, *Central Breakers*,	37	57	23	0	Position doubtful. *Note* 25.
Ariel Rocks,............	40	1	57	37	Seen in 1827. *Note* 26.
Gough's Island,........	40	20	9	45	4,380 feet above the level of the sea. *Note* 27.
Isla Grande,............	*	*	*	*	Very doubtful. *Note* 28.

NAMES.	SOUTH LAT.		WEST LONG.		REMARKS.
	DEG.	MIN.	DEG.	MIN.	
Bouvet, or Circumcision Island, ...	54	16	6	14	Discovered by Monsieur Bouvet. *Vide Note* 29.
L' Aigle Shoal,.........	51	51	64	30	Said to be seen in 1817, but unsuccessfully sought for in 1819, 1820, 1821, 1823, and 1824. *Note* 30.
Aurora Isles, ...	*	*	*	*	Not in existence. *Note* 31.
The Shag Rocks.	53	48	43	25	In appearance like sugar-loaves. *Note* 32.
Kain's Islet,.............	54	9	59	36	Doubtful. *Vide Note* 33.
Pottinger's Bank, ...	54	36	57	49	Passed over in Jan. 1822. *Note* 34.
Alexander Island,......	68	57	73	0	Discovered in 1821. } *Note* 35.
Peter Island,............	68	0	91	0	Ditto.

NOTES ON THE PRECEDING TABLE.

1. SILHOUETTE VIGIA. On the 5th of February, 1754, the people on board the ship Silhouette, commanded by M. Pintault, felt a shock, or violent agitation, as if the vessel had touched upon a shoal. It was then about 5 *p. m.*, and from the latitude taken by that very day's observation, this dangerous spot should be 20′ to the southward of the line, in about 20° 50′ W. longitude, according to their reckoning, which they traced upon the French chart, from the road of Praya, in the isle of St. Jago. On the 13th April, 1758, the frigate La Fidele, M. Le Houx, commander, felt the like shocks, in 20′ S. latitude, and 18° 0′ W. longitude.

2. AQUILA REEF. On the 12th April, 1831, the Aquila, of Scarbro', Captain John Taylor, was in latitude 22′ 15″ S., and in longitude 21° 6′ 30″ W., light winds, and fine pleasant weather. At 40′ *p. m.*, the water being very smooth, and the ship going at the rate of 5 knots, a loud rumbling noise was heard under her bottom, and a sensation felt, exactly like that of a vessel sliding over a rock; the rudder was so much agitated, that the man who was steering could scarcely hold the wheel. No difference could be observed in the colour of the water, nor the smallest rippling. The situation of the Aquila is very near the Silhouette, above described.

3. BOUVET SANDY ISLE. On the 3rd May, 1761, Le Vaillant, Captain Bouvet, about 1 *p. m.*, saw a small sandy island, which bore N. by E. The latitude, by the reckoning at noon, was about 23′ S., and their longitude, reckoned from the sight of Ferro island, which they made on the 8th April, was about 19° 10′ W.

4. TRITON'S BANK. On the 18th December, 1816, Captain Proudfoot, in the ship Triton, passed over this shoal. It appeared to extend in an E. and W. direction, 3 miles, and in a N. and S. direction, one mile; sounded in 23 fathoms, brown sand,—saw no appearance of breakers.

5. SHOAL OF MANOEL LUIS. This shoal lies off Maranham, in latitude 0° 52′ 27″ S., and longitude 44° 13′ W. It extends more than half a mile across from N. to S., but not less than 3 miles in an E. by S. and W. by N. direction. It is formed by a cluster of conical rocks, whose heads are just beneath the surface of low tides, having small openings of deep water (8 to 10, and 17 fathoms) between them, which renders it the more dangerous, as, in case of striking thereon, a vessel would most probably go down immediately; the utmost precaution, therefore, is necessary,

in order to avoid this danger, as it shows itself occasionally at low tides, and then but slightly. It is high water on the reef, on the full and change, at 5 hours, when the tides rise 12 feet, the flood setting S. W., and the ebb N. E., at the rate of three-fifths of a mile in an hour.

6. CROWN REEF. The barque Crown, of Liverpool, bound to Bombay, struck upon something, which was supposed to be a reef, on the night of the 9th February, 1835. After crossing the equator, with a pleasant breeze at E. S. E., carrying fore-topmast studding-sail, going 6½ knots, at 10 *h.* 45 *m.*, touched the ground, and grated with the keel, as if passing over a coral reef. So soon as clear, the boat was lowered down, but no bottom was found at the depth of 120 fathoms. The latitude of the spot was 57′ S., and the mean longitude, by chronometer and lunars, 23° 19′ W. *(Nautical Magazine*, 1835, *page* 577.*)*

7. PRINCE'S SHOAL. On the 17th October, 1747, the ship Le Prince, Captain Beaubriant, in its passage to India, felt one or two shocks, as if it had struck upon a shelf. She was at that time in latitude 1° 35′ S., and longitude 17° 50′ W., reckoned from the sight they had of the Isle of Brava.

8. SUBMARINE VOLCANO. On the 19th May, 1806, Admiral Krusenstern saw in the direction of N. N. W., and at the distance of 12 or 15 miles, a singular phenomenon, but which, owing to the lateness of the day, was unable to examine sufficiently close to ascertain the nature of it. A cloud of smoke arose to about the height of a ship's mast,—disappeared suddenly, then rose again, and vanished entirely. It could not be a water-spout, nor a ship on fire, as some persons on board conceived; for the smoke rose much too high, and was of opinion, that if the whole was not an ocular deception, occasioned by a peculiar refraction of the rays of light, it had all the appearance of a volcanic eruption, and was possibly the forerunner of an island.

9. FERNANDO DE NORONHA. This island has frequently been visited by ships bound to India, occasioned by the currents having set them to the westward, after the failure of the N. E. trade-wind. It is a remarkable island, and is readily known by a high rocky peak, called the *Pyramid*, very barren and rugged, which seems to lead to the eastward, when it bears S. S. W., and by its S. W. point, which is perforated, and gives a free passage to the sea, and therefore, by some, called the *Hole in the Wall.* Off this point, at a considerable distance, lies a sunken rock, which is dangerous to approach. From the S. E. part of the island, named Tobacco point, a reef extends to seaward a considerable distance; and a rocky patch, on which the sea always breaks, lies 2½ or 3 miles S. E. by S. from this point, and nearly 3½ miles S. ¼ W. from the east point. There is a channel of 10 to 15 fathoms water within this patch, and when on it, the Pyramid will be shut in by the highest hill.

Fernando de Noronha is about 7 miles in length, and 2, or 2¼ miles broad. It produces black cattle, sheep, poultry, melons, corn, &c. It is inhabited by Portuguese exiles, and has a strong garrison, and all the little sandy bays and anchoring places are defended by forts. The road is on the north side, near the N. E. end of the island, and the anchorage is tolerably good in 9 to 13 fathoms water, at about half a mile from shore, with the Pyramid bearing from S. S. W. to S. W. It is quite exposed to northerly and westerly winds, which are said to prevail here from December to April; at other times they are mostly S. E. or westerly, and sometimes at N. E. The surf is frequently high, and at such times there is no landing. Fresh water may be procured from a well near the governor's house, but it is a scarce article in the dry season, and cannot always be got off from the shore, on account of the surf. On the south side of the island, to the eastward of Tobacco point, is a small bay, called the Port, fit for boats only, where it is said fresh water may be procured from a rivulet.

The *currents* generally run strong to the westward, therefore the necessity of approaching the road by Rat or Wooding island is obvious. Rat island is about 1½ mile in length, and lies about 1¼ mile from the N. E. end of Fernando de Noronha. It produces grass and fire wood, with some wild goats; but the wood will sink if thrown into the water, and there is great risk in staving the boat while getting it off from the rocks. The tide rises about 6 feet, and flows, on full and change days of the moon, until 4 o'clock.

10. THE ROCCAS lie about 50 miles to the westward of Fernando de Noronha; they are low sandy islands, apparently connected together by a reef, nearly level with the edge of the sea. These cannot be seen, even from the mast-head, in the clearest weather, for more than 3 leagues; they are surrounded with breakers, projecting out at the north and south ends of the shoal, their extent being 5 miles. Vessels passing between Fernando de Noronha and the Brazil coast, at night, must be particularly careful to avoid these dangers, for they have proved fatal to many. Within two miles of their western extremity were found 28 fathoms, coral rock, and the current sets over them to the westward, at the rate of 2½ miles an hour.

11. ASCENSION ISLAND is of an oval form, 7½ miles long, and 6 wide. Like all the islands in the Atlantic, it is of a volcanic origin, presenting a surface of rugged conical hills, of different sorts of lava, from 200 to 300 feet in height, some of them with perfect craters. At the eastern part of the island is a double-peaked mountain, of gritty tufaceous limestone, which rises to the height of 2,818 feet, and, from its comparatively verdant appearance, has obtained the name of Green mountain. The whole island is of a naked, desolate character, with a vast quantity of rocks lying upon each other in a very irregular way, with great chasms between them, and strewed with scoriæ, pumice, and other volcanic substances, so that one might as well walk over broken glass bottles. The sea-coast is alternately of a black nitrous lava, and of white beaches, formed by the pulverization of coral and shells, with calcined stones as light as dust. There are, however, about the middle of the island, between the hills, several little plains, divided into small spaces, and so remarkably distributed as to appear like parcels of land cleared of stones, and separated by walls.

The island was discovered by João de Nova Galego, in 1501, and is said to derive its present name from having been seen on Ascension day. It was then entirely barren and uninhabited; not a shrub was seen,—and the only vegetation which it produced was some coarse grasses, ferns, purslain, a species of convolvulus, and a milk-thistle. There were goats, rats, mice, land crabs, and some few insects on the island. It was also much frequented by sea-fowl, such as the frigate and tropic birds, tern, boobies, and gannet, with whose nests the lower part of the island was covered; being hitherto undisturbed by man, they suffered themselves to be knocked down with sticks, or even laid hold of while sitting on their eggs. Turtle were found in great abundance, and the bay afforded a plentiful supply of fish—cavalies, old-wives, conger-eels, and rock-cod; in consequence of which, the island was much frequented by homeward-bound vessels from the Cape of Good Hope and the East Indies. It was also a great resort for smuggling-vessels from our American colonies, who used to meet the Indiamen here, on their return home. It was long supposed to be without any stream or spring of fresh water whatever; but small springs have since been discovered, and have obtained the name of Dampier's springs, from that celebrated navigator having been cast away here, on his return from New Holland.

In 1815, during the confinement of Napoleon at St. Helena, the British government took possession of Ascension, as a military station, and maintained on it a garrison, consisting of a naval lieutenant, as governor, with 60 officers, seamen, and marines, who fortified the island with 17 guns, the greater number at *English Road*, where they erected barracks and storehouses of the compact lava, (the pulverized coral on the beach forming excellent cement) and contrived to cultivate small gardens, and rear some live stock. A look-out station was established on Green mountain, where a small spring was discovered, which soon yielded an average daily supply of about 140 gallons.

In 1821, the establishment was changed to a major of marines, as governor, with a staff of officers, and a party of about 200 privates, most of whom were artificers and labourers, with a number of liberated Africans. From the attention and exertion of the garrison, the island is now in a state of progressive improvement as to its resources, natural and artificial. Roads have been made, and iron pipes laid down, to convey the water from the springs (an operation that used to be performed by asses and mules) to the fort, near which a large tank has been excavated, capable of containing 1,700 tons, by which it is hoped that a supply of water may always be obtained sufficient for a squadron. Pasturage is rapidly making its appearance. There is a moderate supply of cattle and sheep, which, with turkeys, guinea-fowl, and almost every description of live stock, thrive well; geese and ducks, however, succeed but indifferently, owing to the want of fresh-water streams and pools. The wild goats, to the number of about 600, are allowed to wander in herds, feeding on the herbage they can procure, amongst which are some aromatic herbs, which give a peculiarly fine flavour to the mutton. During the season, which is between February and July, when the turtle come ashore for the purpose of depositing their eggs, parties are stationed on the beach, to turn as many as are likely to be required before the next season, which are afterwards kept in a large salt-water pond, to be taken out at pleasure. Their general weight is from 400 to 700 lbs.

In order to destroy the rats, with which the island was overrun, a number of cats were introduced, which, however, multiplying and becoming wild, proved very destructive to the young fowls and rabbits, so that the garrison have been compelled to call to their assistance a colony of bull-terriers, to wage war on their combined enemies of the feline tribe. Guinea-fowl are very abundant; partridges, pigeons, and rabbits, from the Cape of Good Hope, with other species of game, have been imported, and the horse has lately been added to the list of their useful and domestic animals.

On the Green mountain, above the height of 2,000 feet, all sterility ceases; the soil is a rich mould, yielding sweet potatoes, Cape gooseberries, onions, carrots, peas, beans, cabbages, radishes, and, in short, almost every species of esculent vegetables: there are at present upwards of 70 acres under cultivation. In the valleys also, where the soil offers any prospect of success, spots are set apart for the cultivation of vegetables. Several kinds of fruit have been successfully tried,—and thus an island, which was once a desert cinder, now yields most useful vegetable productions; and as the climate is exceedingly healthy, it is obvious that this establishment will repay the liberal attention that has been bestowed upon it, by affording an eligible rendezvous, and depôt of stores and provisions, for any squadron destined either for the coast of Africa or Brazil. Including civil officers, the expense of the establishment is £10,400 per annum.

The *Anchorage*, though an open bay, is perfectly safe, and the island is never visited by gales of wind, but a heavy surf rolls on the beach, which sometimes interrupts the communication with the shore for days together. There is no regular tide, and the rise and fall is very trifling. On Green mountain the annual range of Fahrenheit's thermometer is from 58° to 82°.

Mr. William Walker, *Queen's Harbour Master*, gives the following description of this island. *Copied from the Nautical Magazine for* 1841, *page* 691. "The island is of an elliptical form, its greatest diameter from east to west being seven miles and five-eights, and its shortest from north to south, five miles and a half The area of its base, at the surface of the sea, is 38 square miles, and its circumference about 22 miles.

"Ascension is of volcanic origin, and of comparatively recent formation, its surface being exceedingly irregular, and presenting, from the sea, a barren and forbidding appearance. The highest peak on Green mountain is elevated 2,805 feet above the sea, and may therefore be seen, from a frigate's deck, at the distance of 65 miles. The latitude of the summit is, from several observations, 7° 57′ 22″ S.; and if the longitude of the fort be 14° 24′, that of the peak will be 14° 19′. From the summit of Green mountain about 40 tumuli may be seen, of different magnitudes, being extinguished craters, which have, at different periods of the volcanoes, actually given vent to its fires. From many of these craters one may trace distinctly the direction of the lava currents, on their way to the sea.

"The principal cultivation is on and about Green mountain, where it rains more frequently than on the less elevated parts of the island. The principal garden is 2,500 feet above the sea: here the climate is delightful, the temperature during the day-time being generally about 74°, that at the landing-place near the fort being 85°. The temperature on the peak is still lower; my thermometer, exposed to the current of air sweeping over the peak, fell to 60°,—this was at one P. M., the instrument being in the shade, and the sun shining at the time. The summit of Green mountain is covered with rock-roses and several species of fern and mosses, indigenous to the island.

"The climate of Ascension is perhaps as healthy as in any part of the world; and its salubrity is no doubt owing to the constant trade-wind blowing in a moderate breeze, ventilating and cooling every part of the island; the dryness of the air, and the absence of marsh or moist soils, contribute to the elasticity and buoyancy of the air, and renders the island a most desirable spot for an invalid, who might be transported from Tartar stairs to the mountain in two hours, the distance being 7 miles, from a temperature of 84° to one of 74°. Abundance of purslane grows among the rocks, stones, and crevices of the cliffs. This vegetable is eaten by the cattle, and is capable of keeping them alive and in tolerable condition, as was evident from a bullock making his escape, and being absent five or six months, during which time he had nothing to eat but purslane.

"The weather side of the island is high and inaccessible, with an iron-bound coast, and deep water. No part of the coast is accessible from S. W. bay, round the south point of the island, and as far as N. E. bay. From the south point of S. W. bay, and along the lee side of the island to English bay, there is an excellent anchorage in from 10 to 20 fathoms water, sand and mud, within the distance of 6 miles. Three hundred sail might be anchored at the distance of 100 fathoms from each other; for although the coast from the fort, round to S. W. bay, be rocky, with foul ground, extending about half a mile into the sea, as marked on the chart, yet I found the bottom perfectly clear without the depth of 10 fathoms.

"The coast to leeward of the island is bold and clear, from English bay to the fort near Tartar stairs. About a mile to the N. E. of the fort, there is a small bay, with a spot of sand on it, on which a boat may land, among wild and irregular climpers: this spot has been dignified by the name of *Comfort Cove*, and extolled very much above its real merit. From the foot of Fort Cockburne, round to the westward as far as S. W. bay, the coast is, as has been already observed, rocky. The reef runs out about seven-tenths of a mile from the fort, in a N. W. direction; it is composed of uneven masses of hard pointed lava, with spots of white sand in the hollow places. There are many of these pointed rocks on which a ship would strike, and on some of which ships have actually struck; and to prevent such accidents for the future, a large buoy is now moored near the extremity of the reef, on a rock, having 30 feet water on it. The following are its marks:—The flagstaff on the fort in a line with the N. E. corner of the jetty, near the crane at Tartar stairs, and the peak of Green mountain just touching the edge of Red-cross hill. Should the buoy be gone, by keeping in 10 fathoms, a ship will avoid all the dangers on the reef.

"It sometimes happens that a very heavy swell sets in from the south-westward, occasioned by gales of wind, without the limits of the trade-winds, in the South Atlantic. The long swell rolling in *against* the wind, and meeting with shoal water and the uneven rocky bottom of the reef, breaks high, and with violence—sweeping away thousands of tons of sand from the beach into deep water; this sand is again thrown on shore in fine smooth water. These *rollers* are heaviest when the sun is in the northern hemisphere; and storms and tempests in the South Atlantic, in the neighbourhood of Cape Horn.

"Two pair of moorings are laid down near the landing-place, for the use of H. M. ships; one pair abreast of the middle of the sandy bay, to the eastward of the fort, and as near the weather shore as possible. The groundwork is line-of-battle ship's chain, and the bridles are tapered from line-of-battle ship's chain to sloop's; the small end being suspended to the buoy, for the convenience of being taken *without lighters*. The other pair is laid down near the edge of the reef, one of the anchors being among the rocks, thereby leaving the best of the anchorage unoccupied. At the inner mooring, in case of necessity, one vessel might be hove down by means of another.

"About half a mile inland from S.W. bay, and behind the lava currents, lying near the beach, there is a tract of land of comparatively smooth surface, and of considerable dimensions; the soil is very rich, but so dry and dusty as seldom to exhibit any other verdure than a little purslane. A little further to the south-eastward, and behind some high conical hills, there is a sandy plain, having an area of, perhaps, 20 or 30 acres. This level is surrounded by the above-mentioned conical hills on the north, and on every other side by high ridges of lava, through which the rains have worn finmari, or water courses, by which considerable quantities of sand and pumice have been discharged into the plain. I could trace, very distinctly, a line of pumice and other floating materials on the foot of the hills, along the lee side of the plain, left at the *last high water mark*, and shewing most clearly that at times there has been a depth of several feet of fresh water in the valley, a quantity sufficient to supply the island for many years. This affords the strongest proof of the occasional heavy rains that must fall at Ascension, and points out the propriety of constructing tanks in eligible situations.

"The principal supply of fresh water is obtained on the Green mountain, where there are several drips of water, which yield from 500 to 1,500 gallons daily, according to the wetness of the season. The rain falling on the mountain is absorbed by the porus and light soil, and descends by its gravity till it meets with a thin stratum of pumice dust, which in the course of time has been in a manner petrified; this arrests the water in its progress downwards, and, being generally inclined to the horizon, the water glides along and appears on the surface of a cliff in the shape of a spring. It is to be regretted that the strata above-mentioned are *faulty* in so many places, that much water passes through the rents, and is lost in the soil below.

"There are two very good stone tanks built in the mountain, in contact with, and parallel to rocky cliffs. The surface of the rock has been cleaned and gutters cut, by which means all the water that is not absolutely absorbed during rains, on a very considerable surface, must run into the tanks. The tanks in the mountain are to be connected with others below, near the landing place, at Tartar stairs, by means of cast iron pipes, the distance between them being five miles."

ANCHORAGE OFF ASCENSION. Extract of a letter from *Captain Hunt*, of the ship Atlas, dated 19th March, 1832, off the Isle of Wight. "The Island of Ascension being both convenient and safe, for ships homeward-bound, to approach, when in want of provisions,* water, or repairs, and Captain Bate† and the officers of that establishment most attentive and ready to relieve the wants of ships of any nation, resorting thither; and their means to do so, and to render assistance, being superior to any other place between the Cape of Good Hope and the ports of Europe, it is to be regretted that accidents so frequently happen to vessels touching there. In most cases I am persuaded they have occurred through want of knowledge as to the position of the rock and reef lying to the N.W. of the anchorage.

"The anchorage off Ascension is in Sandy bay; a prominent rock, on which is a fort, forming its western boundary. Ships may anchor in any part of this bay, in moderate depths of water, as the bottom is clear, and free from danger.

"Commanders of ships, coming from the eastern side of the island, intending to anchor or cruize off the settlement, until they have obtained supplies, must observe, that no safe anchorage can be found to the *westward* of the fort, (above-named,) neither is the shore safe to approach within a mile and a half of it, to the *westward* of that fort.

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* *The following letter is copied from the Nautical Magazine for* 1839, *page* 167. "Mr. EDITOR,—An opinion prevails amongst ship-owners and masters generally, that vessels may be supplied with provisions, such as beef, bread, &c., from the government stores in the Island of Ascension. Such opinion, however, is contrary to fact; for on calling there on my passage home from Singapore, in July last, (1838,) Captain Evans (commandant) informed me, that, 'only in cases of extreme want or distress, was any provision to be supplied to vessels calling there.' Nor is water to be had in such an abundance as I was led to believe; one gallon, per man, per diem, allowing the passage from there to England to be 42 days, was all that could be spared to the Trinculo. Government has fixed the price of Turtle at 50s., per large and small, which you will perceive is 20s. more than the price stated in page 299 of the second volume of the Nautical Magazine. Thus you see that there is no inducement to ship-masters to give the preference to Ascension over St. Helena. It is but justice to add, that the commandant and officers, at the former island, appear to be most anxious and willing to oblige those who call there, as far as their limited means will admit. Should you deem any part of the above worth inserting in the Nautical Magazine, for the information of my brother 'wanderers on the deep,' the majority of whom, perhaps, are not aware of the recent regulation, it will oblige,

Your obedient servant,

JAMES R. REA."

† This gentleman and several of his people fell a victim to fever, which broke out here in 1838.

" The best guide to clear the reef and rock, lying to the N. W. of the anchorage, (and on which so many vessels have grounded) is to keep the houses and barracks open to the eastward of the fort, and never to shut them all in with, nor open them to the *westward* of the fort, unless the distance from the land be at least a mile and a half. In the latter case they would be in great danger of striking on the reef above-mentioned, the spit, or rocks, of which lie nearly a mile from the nearest point of the shore.

" A buoy, chequered black and white, is to be laid on the spit. When this buoy can be seen, a vessel should never pass to the *westward* of it, unless her distance from the land be at least one and a half mile. The sea does not always break upon this rock, but there is always a considerable swell passing over it.

" Ships approaching Sandy bay, from the western side of the island, must be careful not to get nearer to the land than a mile and a half, until the houses and barracks be opened to the eastward of the fort. They may then stand into Sandy bay, to their own depths, free from all danger.

" By attention to the above observations, it will be impossible for ships to meet with accidents, for on all other parts of the island the coast is bold, and may be approached to within a cable's length.

REMARKS OF COMMANDER FISHBOURNE, H. M. STEAM-VESSEL ALBAN. *Nautical Magazine for* 1843, *page* 158. " Vessels steering for the anchorage of Ascension should haul round the north side of it, and keep at such a distance as to prevent being becalmed, until they open the anchorage, when they should keep close along shore. By this means they will fetch into a good berth without tacking. It is not advisable to bring Cross hill, on which is the semaphore, to the eastward of S. S. E. ½ E.; for though you might do so, and be still clear of the foul ground, you would be within the influence of the rollers, which sometimes break a mile N. N. W. of the western extremity of the bay, roll over the foul ground, and so agitate the water, on the anchorage side, as to render it highly imprudent to allow of a loaded boat lying alongside.

" Vessels making the land, towards nightfall, ought to keep well in by the north end of the island before dark, taking the bearing of the Three Sisters' hill, easily known by there being four prominent stones on its summit. This hill has been mistaken for Cross hill, and in consequence a very dangerous berth taken, which the vessel was obliged to weigh from immediately, and not without apprehension that a flaw might cast her on the rocks, which were quite close. Having made the Sisters, stand on until Cross hill opens, haul close along shore, without apprehension, till Cross hill bears S. S. E., and anchor in 9 or 10 fathoms. Cross hill, in the centre of the sandy bay, may be a better direction, as the difference of compasses may throw a vessel into a bad berth, from its proximity to the foul ground. Water is to be obtained readily here, and seldom without fail. Many vessels are supplied even when the rollers are in.

" The *rollers* are said to be very capricious in their rise and progress, but this assertion, I think, will fall before continued observation; and my experience of eight months tends to shew that they render, to reason, a sign of their coming, if not a solution of their cause. A distant ripple, extending itself to N. W., from the extremes of land, was visible from any part of the bay, or island, appearing to arise from the water outside of the island being higher than that within the bay.

" This ripple was apparent from the middle of February to August, and of greatest amount in May and June, and seems to be the result of a N. N. Westerly current, which runs during these months. This current divides at the southern extremity of the island, passing along either side, and forms the rollers which flow laterally into the several bays of the island, the southern extremity of each bay preventing a direct inflow. Thence the direction of the roller must depend upon the position of the bay, with respect to the current.

"They commence, however, generally from a direction as far to the southward as the southern extreme of each bay will admit of, from which direction, subsiding as they alter their direction or sweep round the point of the bay, they disappear about five points north of their first direction. They commence in February, and become more frequent and heavy in May and June, after which they are less in size and frequency, and cease in September. I have been told that rollers come in from the north in December. This, however, is rare, but they are then quite as high, if not higher than at any other period.

"While I believe the direction to be correctly stated, I think the height exaggerated, it being estimated from the effect upon the pier,—which effect must always be greater, all other things equal, than from any other direction, on account of the more direct action,—the pier being open most to waves from N. to N. W., the foul ground breaking their force when from the westward.

"The rollers were generally preceded by light and variable winds, and followed by an increase of trade-wind, (considerable when the rollers were highest) and an extremely attenuated atmosphere, so transparent, that the Green mountain certainly appeared but half its distance from the anchorage, and this without any increase of moisture. Once there was considerable moisture,—the mountain appeared then still nearer, and the rollers were accompanied, if not preceded by rain. Attention to these indications enabled me to predict the coming rollers; and though I inferred corresponding barometric changes, I was not surprised at the apparently insufficient differences, on account of the many circumstances attending to vitiate the apparent unconnected, if not corrected results. For instance, the mountain being on the weather side of the island, and the bay on the lee, the clouds condensed by the mountain pass over the bay in dense masses, assuming a singular constant triangular shape, during the aforementioned months, the apex of the triangle being in the N. W.,—though the tide may be in some measure corrected,—for when regular, its height is too irregularly modified by the rollers to admit of a correction. The concentrated heat in the bay, modified by the direction and force of the wind, producing a greater or less increase of elasticity, all tend to vitiate barometric results.

"The following may go far to elucidate the causes of the abovementioned effects. Lieutenant Bold, in his African Guide, says, 'that the currents have northing or southing in proportion as the trades incline towards the tropics, and their velocity is increased by an increase of tradewind.' Now, such must be the case at this place, during the months of May, June, and July, when the S. E. trade is extending its northern limit further to the northward, and will account for the strong ripple mentioned before; and also for the strong N. N. Westerly current, which we found in July to be running full 30 miles in 24 hours, in smooth weather, and must have been quite 35 miles during the stormy breezes which we experienced in June. Again, the height of the barometer, in this latitude, being less than it is to the southward,—this last, increased perhaps by more southing, being in the wind in May and June, together with the fact that the rarefaction of the air in the tropics (and being greatest here about May and June) produce an ascending, consequently relieving pressure current, and to the greatest amount during these months, will tend to induce a wave in this direction from the point of greatest pressure, which must be from the south, while the sun is so far north of this latitude; and from the high barometric state, together with the descent of the superior return current in the southern latitudes, we may infer a wave will be propagated in the direction of the point of least pressure, which will be generally to the northward in this hemisphere, but I presume must be so during the months of May and June.

"If this implied want of hydrostatic equilibirum be correct, it ought to be greatest, or at least produce greatest effects in the winds, currents, and rollers, in the months of May and June. I find, on reference to the log, that the winds were of greatest force during the last days of April, but still strong through May and June. The Edward, of Shields, arrived here, having experienced strong winds in May; and H. M. Ships Fawn, Prompt, and Rolla arrived here early in June, having had to contend with strong southerly winds, with a northerly current; and referring to the remarks in the meteorological table, I find that the rollers were heavy, and most continuous in May and June.

"To account for the change of direction in the rollers as they pass to their subsidence, I can well imagine that, as the equilibrium is in process of restoration, the currents of air and water will decrease in velocity, the wave also will decrease and alter its direction, till even re-action may produce almost an opposite direction, in which cases it must roll into bays open to the N. W. The anchorage here, and at St. Helena, being on the N. W. side of the islands, may account for the rollers being said to come from the N. W.; and it is probable that they are highest at the anchorages, from their being to leeward. The period when the rollers are said to come in from the northward being in December, at which time the sun is in high south declination, it is not improbable, I think, that the pressure may be greater to the northward than here, and hence propagate a wave in this direction. There is a singular, and, as I am told, regular process observable here,—and it appears consequent upon the rollers or their causes,—which is a beautiful illustration of a nice adaptation of a universal law to individual habitudes, and another of the many proofs of design with which earth, air, and ocean are strewed,—bespeaking a Creator, lavish in greatness, supplying all our real wants, bounteous in goodness and truth.

"The selvage of sand round the bays, where the turtle lay their eggs, is increased considerably in breadth, during the season of incubation. In this process of extension it becomes shelving and easy of access, after which it appears to narrow to its original dimensions, and becomes precipitous, thus affording additional space and facility of gaining it.

"Of the many vessels which arrived at Ascension from England, one only made a really good passage, owing to their going by the western route, or in consequence of standing over to the African shore, supposing, no doubt, that they would not otherwise fetch Ascension.

"The course I should recommend, is to pass sufficiently far to the westward of the Cape de Verds, and continue till to the southward of their influence, in order to avoid the calms, with rain in squalls, which generally obtain under their lee. Then shape a course for 16° on the equator. This will bring you soon into the S. W. wind, which obtains generally throughout the year, and which will enable you to make southing to get out of the easterly current, the limits in latitude of which vary from the equator to 2° North. A westerly current obtains to the southward of this, and within narrow limits. Should you not have crossed the line before coming to 8° longitude, go about, if you can make a west course by compass on the port tack, from which you will fetch Ascension as you come up, on drawing out from the African coast.

"Several steamers have taken the eastern passage to the Cape of Good Hope, erroneously considering that they will invariably have land and sea breezes to aid them to the southward, and that they will be enabled to get fuel, not only in sufficient quantity, but with facility. The green wood which is to be had is a very insufficient fuel for obtaining full steam, and even this is not to be procured without delay. It is better far to coal at Ascension, but even this delay may be avoided by husbanding fuel on the passage from England,

"For instance, let a vessel leave England with 14 days' coal on board, and have also the ordinary amount of sail that our men-of-war steamers have, such as the Vixen; then working expansively, and taking advantage of the winds, she need not expend more than 7 days' coal before she arrives in the S. E. trade, from which she must sail with one engine going to the southern limits, which may thus be reached by vessels such as the Vixen in 8 or 9 days, and the westerly winds may be reached in one day more, having expended then from 12 to 13 days' coal. These westerly winds will run her to the Cape in 8 or 9 days, or even to a position to fetch Mauritius with the S. E. trade in 5 days more. If she be bound to China, this would be advisable, though, in following this route, she may have gone much to the southward of her direct course to the Cape, she will yet have attained to a latitude in which the degrees of longitude are so short, as nearly to compensate for that but apparent great difference. Now, let it be supposed that the same vessel shall have gone to Ascension with only the same consumption of coals, or two days at least more. If she objects to make the detour necessary to fetch it under sail, this she cannot effect under two to six days more time. She will not then complete her coals, in the first case, under 6 days, and in the second case, under 8 days. She will not then reach the Cape of Good Hope, if she steer direct, in 14 days time, and may be blown off by a south-easter, and then have to stand to the southward under sail, her coals being expended; while, if she shape her course to the southward of a great sailing course, as far as may be, without increasing her distance above that of a direct course distance, she will have arrived in the westerly winds, which will run her into the Cape, so as to insure fetching, though a south-easter should catch her, and this in about 15 days, perhaps with a saving of one or two days' coals, which are valuable, to contend with any unforeseen difficulties which might occur. For instance, they might enable her to steam in against a north-wester. Then, suppose a similar vessel to make the eastern passage, and to complete her coals at Fernando Po, she will not arrive at this place till 6 days, at least, after another may have reached the northern limit of the S. E. trade; she will then require 6 days to complete her coals;—she will not then reach the Cape, husbanding her coals as she may, under 20 days, for which she must have 18 days' fuel. If she stop anywhere to obtain the 4 days above her ordinary quantity, it will occupy fully 8 days, if not 8 days will not be more than enough, to allow for completing the passage under sail."

REPORTED DANGER TO THE N. E. OF ASCENSION. EXTRACT FROM THE NAUTICAL MAGAZINE FOR 1832, PAGE 561. "On the authority of Commodore Hayes, and Mr. A. Weir, the master of H. M. S. Dryad, we can no longer give credit to the statement of Mr. Fraser, of the ship St. George, in 1830, relating to the existence of a dangerous rock to N. E. of Ascension. By the following it will be seen, that the Dryad and her tender went in search of it; and from the care taken in the observations, as well as the common occurrence of shoals of fish being frequently seen in those latitudes, and the great probability that it would have been discovered before, had such a rock existed, we must conclude that there is no such danger.

"The master of the ship St. George, on her passage to the Island of Ascension, in the employ of Government, on the 14th October, 1830, having reported the existence of an extensive danger, in latitude 6° 35′ S., longitude 12° 57′ W., and left with the commandant of Ascension an extract from his log, relative thereto, H. M. S. Dryad, accompanied by her tender, sailed from that island on the 14th January, 1832, to search for, and, if possible, give so dangerous a shoal a positive position. On the following day, at 11 A. M., the Dryad was upon the exact spot, the tender bearing N. W. 4 or 5 miles, the day very fine and clear, a five or six-knot breeze by the wind, and sufficient swell to break upon a shoal; nothing, however, indicating the existence of a shoal could be detected."

12. ST. HELENA is a small rocky island, about 1,200 miles west of the coast of Benguela, in South Africa, and nearly in the latitude of Cape Negro; and about 1,800 miles east of the coast of Brazil, in South America. It was discovered, on the 15th of August, 1502, by John de Nuova, a Portuguese navigator, on his return from the East Indies. This discovery happened on the anniversary of the festival of St. Helena,—he called the island by her name. It has been uninterruptedly in the hands of the English ever since the year 1674; and its situation and supply of pure fresh water have gained for it the notice and patronage of the East India Company. St. Helena will attract particular notice to the end of time, as the sequestered spot to which the late Emperor Napoleon Bonaparte was consigned as an exile.* Seen at a distance the island appears like a lofty mass of barren rocks, rising in a pyramidal form; on a nearer approach, rugged and almost perpendicular cliffs, from 600 to 1,200 feet high, are seen encompassing the island all round, broken through in several places by deep chasms, which open to the sea-shore, and which form so many narrow valleys, winding up the table land in the centre of the island.

One of the principal of these openings is called James' valley, on the N. W. coast of the island. And at the opening of it to the sea is James' Town, the only town and port of the island, which is defended by strong batteries, and is the residence of the authorities. Ascending James' valley we arrive at the plain or table-land of Longwood, situated in the eastern part of the island, and consisting of 1,500 acres of fine land, nearly 2,000 feet above the sea, sloping gently towards the S. E. In the centre of the island rises Diana's peak, 2,693 feet above the sea. A calcareous ridge, which runs across from east to west, sloping abruptly on the south, divides the island into two unequal parts; the larger and finer of which is on the north side of it, containing James' valley, Rupert's valley, Longwood plain, the deep crater-like dell, called the Devil's Punch-bowl, the Briars, near which is a fine cascade, Plantation house, which is a country residence of the governor, &c. The whole circumference of the island is about 28 miles.

The population, exclusive of the garrison, is about 5,000, about one-third of which are Europeans, and the rest are blacks, men of colour, and Chinese. The climate of St. Helena is one of the healthiest under the tropics, and is found beneficial to invalids from India, and even from Europe. The range of the thermometer, at Plantation house, is from 61° to 73° within doors; it sometimes falls to 52° in the open air, between June and September. In James' Town it is generally from 5 to 7 degrees higher than at Plantation house, and at Longwood it is somewhat lower. The summer rains fall in January or February, and the winter rains in July or August. Cloudy days are frequent and refreshing throughout the year. Viewed from the sea the island appears barren, but the interior is covered with a rich verdure, and is watered by abundant springs; the soil of the valleys is very rich, and produces all the fruits and flowers of Europe and Asia. Horned cattle, sheep, and goats feed on the rich pastures. Pretty cottages, in picturesque situations, are scattered about the island. The base of the island appears to be basalt, and lava and scoriæ are found scattered about the surface.

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* His body was removed to France on the 18th of October, 1840.

The only LANDING-PLACES are at Rupert's and James', or Chapel valleys. In Rupert's valley, toward the sea, stands a strong battery, well mounted with heavy cannon; but the valley is not habitable, because it has no water. In the entrance of James' valley stands James' town, which is defended by a very fine line of 32-pounders, and flanked by a high inaccessible battery upon the rocks, called Munden's close, under which all ships must pass that come to anchor before the town. The water that supplies the garrison and shipping is conveyed by leaden pipes from a spring in the valley, distant more than a mile from the sea. These pipes lead the water to the jetty, where there are two cranes for the use of boats, in loading with goods or water-casks, or for receiving stores from the shipping, The water is of the purest quality, and in great plenty. In a moderate season, six hogsheads are yielded every minute, and shipping may be supplied with 300 tons every twenty-four hours. On the right or western side, the valley is entered from the interior, by the steep promontory called *Ladder Hill*, the zig-zag road upon which (9 feet in breadth) has a wall on the side next to the precipice, and is very easy of ascent. On the left of the valley, the carriage-road, called *Side Path*, is the avenue to the interior of the island eastward.

On the ridge above Ladder hill, is the observatory, now no longer in use, as the time-ball, which was originally hoisted here, is removed to the town, and is in charge of the master-attendant, whose attention to it is unremitting. The ball drops at mean noon, St. Helena time, for the benefit of the inhabitants, and at one *p. m.*, for the advantage of the shipping. The ball is hoisted half-mast high, five minutes before the time, and at one minute before, to the mast-head.

The following official notice, dated St. Helena, 21st January, 1834, states, that "To prevent mistakes, a *white ball*, hoisted upon a staff, will denote the time as follows:—the ball will be hoisted half-mast at *five* minutes, and close up at *two* minutes, before *twelve o'clock*. At the instant of the *mean time*, at noon, of St. Helena, the ball will drop from the top of the staff, when the gun will be fired at High Knoll. The signal will be repeated at *one o'clock*, at the instant of *Greenwich mean time*, for the benefit of the shipping. A ship wishing to correct her chronometers, and arriving *after one p. m.*, and not likely to remain the twenty-four hours, may hoist the *Blue Peter* at the main-top-gallantmast head, when the same method will be adopted at the next ensuing hour after the signal. Foreign ships to substitute their ensign for the *Blue Peter*.

"Should there be any uncertainty, and the ship wishes to have the signal repeated, she will dip the flag, and re-hoist it on observing the ball half-mast. The ball will again drop at the ensuing quarter of the last hour. Ships concealed from a view of the signal station will attend to the repeating-ball at Ladder hill, and in neither case is any allowance to be made for loss of time, since the astronomer will make the calculation of the few tenths required. *(A most luminous description, with plans of the time-ball and machinery, will be found in the Nautical Magazine for* 1835, *page* 658.

All ships in approaching the island must heave-to, before they can pass Sugar-loaf point, and send a boat with an officer to report them; the boat is generally hailed from the battery at the point, but she must proceed to James' Town, to give information to the governor, before the ship will be permitted to pass the first battery of the Sugar-loaf. Ships-of-war, as well as others, must observe this precaution, or the batteries will open and prevent them from gaining the anchorage. When the boat is perceived returning, the ship may make sail; and after passing Sugar-loaf point, within a cable's length or less, keep the shore close on board, in passing Rupert's valley, with the head-sails braced well forward, to prevent them from being taken back by the gusts of wind that blow from the high land, which frequently veer several points. Having passed Rupert's valley, you should keep near to Munden's point, but take special care to avoid the sunken rock which lies off the fort, at between 30 and 40 yards from the point; upon this rock a small buoy with a red flag is placed.

When you are beyond Munden's point, you will perceive James' Town and valley, off which is good anchorage, with from 8 to 15 fathoms water—bringing the flagstaff on the fort, in James' Town, to bear S. S. E. or S. E. by S., and Sugar-loaf point N. E. by E., distant half a mile from shore. There is also good riding abreast of Ladder hill, or off its eastern point, having the flagstaff E. S. E., and about 14 fathoms water. You should moor with a stream or kedge-anchor to seaward, on account of the eddy winds which commonly prevail, particularly near Ladder hill. Those anchoring in the stream of the valley seldom swing toward the shore, for a constant breeze, and frequently gusts of wind, blow from the valley to seaward; with light winds, the vessels will, at times, swing alternately to the eastward and westward, which is occasioned by a sort of tide or current; but this current is very week, and at full and change of the moon the rise of water is seldom more than 2 or 3 feet.

The bank of soundings begins off Rupert's valley, and extends along the N. W. side of the island, so far as the S. W. extremity, or Horse-pasture point; but there are no soundings to the eastward of Sugar-loaf point, except close to the cliffs.

Sperry Ledge is a reef, two cables' length, with depths of 16 to 10 fathoms; and pointed rocks, of 24 to 18 feet, between it and the south point of the island, from which it is distant better than a mile S. by W. *(true.)* This is the only danger at any considerable distance off the island, and it is not in the way of ships, unless they fall to leeward and round the south point; in such cases, they should give it a berth of two miles, till it bear about N. E., then haul up for the S. W. or W. point, which is bold to approach.

Barn Ledge is about 1½ cable's length in circuit, with 12, 8, and 6 fathoms on it, to 3¼ fathoms, sharp rocks, on the shoalest parts. Barn point bears from it N. W. ¼ N., distant about three-quarters of a mile, and there is 24 or 20 fathoms between it and the shore, with 32 fathoms near it on the outside. Large ships coming from S. E. should keep the small islet, called George's island, well open with Saddle point, until Sugar-loaf point is open with Barn point, which will carry them clear outside of the ledge; or keep a mile from the shore till nearly abreast of Barn point which is the N. E. point of the island.

About two miles to the S. W. of James' valley is Lemon valley, where there is a run of good water, but too difficult to come at, on account of the surf which beats against a rocky shore. Vessels do not often anchor here, being too far from the town; but they frequently ride off Rupert's valley, though the ground is not so good as it is abreast of James' valley and Ladder Hill; here the soundings extend about one mile from the land, sinking suddenly from 40 fathoms to no ground; ships, therefore, should not anchor too far out, near the edge of the bank in deep water, for the gusts of wind which come from the valley will start your anchor, and to let go another will be unavailing, as, from a sudden declivity of the bank, it will not reach the ground. Should a vessel anchor in 35 or 40 fathoms, and the anchor not hold, all the cable may be veered out, to make her ride, until it may be convenient to warp further in; but you should never let go a second anchor, for if she will not ride safe with one, it ought to be hove up, and you should work in by short tacks, under the lee of the island, until you gain a better anchorage.

Vessels bound to St. Helena, after crossing the equator, generally stand to the southward as far as 29° 30′ S., or even 31° if necessary, until they get variable winds, with which they run down their easting, and then stand to the northward, into the S. E. trade, for the island. Some few ships have found the trade-wind vary so much that they have never gone to the southward of 20°, but, availing themselves of the changes, have tacked as the wind varied, and worked up to the island, between it and the parallel of 15° S.,—but this has seldom happened.

During the months of November, December, January, February, and March, if, on crossing the equator, a ship finds the wind incline from S. W., she may, by standing S. E. across the Gulf of Guinea, close on a wind, and afterwards tacking as it veers to the east or west of South, most probably reach St. Helena in less time than if she had proceeded by the former, or *western route.* But when the sun has great north declination, this *eastern route* seems precarious, while the other is certain at all times. Although it has been the practice of ships going the western route, to run so far as 32° and 33° S., yet it can seldom be requisite so to do, as it lengthens the passage: those ships which have not proceeded so far south, have generally made the best passage to St. Helena. From the time of losing the N. E. trade-wind, forty or forty-four days may be considered a fair passage, by the eastern route, in the above months. From the same limit, forty-three days may be considered a medium passage, by the western route; and during any months in the year, it may be made in this time. From St. Helena to the Cape, a month is considered a fair passage.

13. BANK OF ANTONIO VIANA. This bank, according to "Pimental," lies between the 17° and 18° of South latitude, about 70 or 80 leagues W. S. W. from Cape Negro. It is considered very dangerous to ships coming from Brazil to Benguela and Angola; one of the rocks only appears above water. The shoal is very steep, and cannot be discerned in the day time till you are near, on account of the foaming of the sea, the noise of which may be heard at a great distance, and may warn you of the danger in approaching it during the night.

14. MARTIN VAS ROCKS. These are three high and barren islets or rocks, of which the central one is the largest, and may be seen at the distance of 8 or 10 leagues from a ship's deck. This is a little more easterly than the other two, although they are nearly on the same meridian, as they are all in one, when bearing north or south. The northernmost and central rocks are near each other, but between the latter and the southernmost is a channel. They are all steep and inaccessible, and the distance between the two extreme ones is about 3 miles; when seen at a distance they appear like five heads of land.

15. CONGRESS BANK. A bank of soundings, coral or rocky bottom, of 35 fathoms, is said to have been found by the American frigate Congress, on her voyage to Buenos Ayres, in the latitude and longitude stated in the Table, (page 185.)

16. ISLE OF TRINIDAD. This island is about 6 miles in circumference, and appears high and uneven, is distinctly seen in clear weather from the rocks of Martin Vas, and may be perceived from a ship's deck at the distance of 12 or 15 leagues. It extends nearly S. E. and N. W., is generally rocky and barren, though in some parts there are trees of 18 inches diameter, particularly about the south part of the island. The shore is surrounded with sharp, rugged, coral rocks, and of difficult access, occasioned by the high surf that continually breaks on it in every part.

The fresh water is good, and supplied by two small streams, which run down the E. and S. W. sides of the island; it may also be procured at times from the rock which forms the S. W. extremity, but neither of them will fill a tube of 6 inches diameter, and it is doubtful whether these streams are temporary or perennial. Ships should not stop here for water, unless they are greatly in want of that article, for the difficulty of getting it from shore is great, and often impracticable; the anchorage is also unsafe, as the winds are variable, and should a gale happen from W. or S. W., they would be in great danger of driving on shore.

The best anchorage for those who are obliged to stop here to procure water, is about a mile off the west end of the island, that they may be able to clear it on either tack, should the wind shift and blow on; here they will have from 30 to 40 fathoms water, on coarse sandy bottom. Within a musket-shot of the shore are 16 or 18 fathoms, but it is not safe to lie so near. On the western side, nearly detached from the island, there is a rock 800 feet high, with trees upon it, called the Monument, or Ninepin. There is also a stupendous arch, which is perforated through a bluff rock, about 800 feet high; the arch is about 40 feet in breadth, 50 feet in height, and 420 feet in length. The sea breaks through it with a great noise, and there are more than 3 fathoms water under it. When the sea is moderate, you may see through this arch into the only bay in the island, and have a view of a distant rock, covered with trees. At the S. E. end of the island there is also a rock of a conical form, about 1,160 feet high, with trees likewise on its summit, called the Sugar-loaf; and whenever it rains hard a beautiful cascade of above 700 feet is projected from it.

Although Trinidad is within the southern tropic, the S. E. trade-wind is not regular; N. E. and Northerly winds often happen, particularly the former. Sometimes light airs and calms succeed the S. E. winds; and sometimes hard squalls or S. W. gales have been experienced, which render the anchorage very hazardous. Trinidad is often seen by ships passing to the southward through the S. E. trade-wind, but is seldom visited, on account of its unsafe anchorage.

17. THE ISLAND ASCENSAO is said to lie midway between Trinidad and the main, and thus described :—It is stated to be high, having a cove on its north side, with fresh water; off its western side are five small islands or rocks, one of which, stretching out to seaward, appears like a ship under sail. Fish and wild fowl are there in abundance. In this situation it has been repeatedly sought for in vain, and, therefore, modern navigators deny its position, and seem to doubt its existence. Notwithstanding this, it has been said, that land was seen by the Commander of the *Telica*, steamer, on her passage to Peru, in 1825, which appeared to lie in latitude 20° 35′ S., and longitude 37° 28′ W. The island bore S. E. by E. $\frac{1}{4}$ E., by compass, distant by estimation about 8 leagues.

18. **COLUMBUS, OR SAXEMBURGH ISLAND.** This island is stated to be about 4 leagues long, running from N. W. to S. E., and 2½ miles broad, its N. W. point appearing to be a high bluff perpendicular promontory, running off to the S. E. Several trees are upon the island, which is said to have a sandy kind of beach; but its existence is considered more than doubtful.

19. **GRANT BREAKERS.** The position of this danger is extremely vague. It is said to have been seen by Captain Grant, in 1800, who observed high and dangerous breakers, 32 miles S. E. ½ S. of compass, of latitude 31° 13′ S., longitude by account 11° 48′ W.; he considered them the same as seen by a former vessel, who placed their situation in latitude 31° S., longitude 21° 45′ W.

20. **LAUREL SHOAL.** Captain McDonald, of the Laurel, bound from London to Valparaiso, in 1822, and touching at the River Plate, says, he discovered a shoal in the latitude stated in the table (page 185)—it appeared about a mile in length, and the same in breadth, having a sea breaking very high over it; it had the appearance of sand, and seemed very shallow. He passed within half a mile of it; then hove to, and sounded with 90 fathoms, but found no bottom.

21. **TRISTA D' ACUNHA.** This group consists of three islands, the largest and northernmost being named after the discoverer, Tristan d' Acunha; it is about 30 miles in circumference, and of circular form, being the base of a mountain which terminates in a peak, 8,326 feet above the sea, and may be seen at 25 or 30 leagues distance. It is sometimes covered with snow, when the sun is in the northern hemisphere. There is a considerable space of level land, fit for cultivation, between the shore and the foot of the mountain,—the soil rich, deep, and adequate to the production of all kinds of vegetables, &c. There is said to be shallow water and breakers extending full two cables' length from the west point of the island; at other parts the shore is bold-to, but modern accounts state it to be free from rocks or dangers of any kind. At the north side of the island, the land rises perpendicularly upwards of 300 yards, whence it ascends with a gentle acclivity to the base of the peaked mountain, which rises majestically over the table land. There is a bay on the N. W. side of the island, with a beach of black sand, where boats may be hauled up; the bay, however, is open and much exposed. Here is an abundance of good water, falling from two cascades; one of them is so conveniently situated, that the water may be conveyed into the casks in the boats by means of a long hose. Around this bay is plenty of wood, but the trees are small, and of the maple kind, burning remarkably well; and on the east side of the island is commonly a quantity of drift wood, but never any on the western side. The shores abound with wild celery, dorrel, and parsley; and there are numbers of wild goats and hogs, but apparently no other quadruped; large quantities of various fish frequent the surrounding sea, and the shores are covered with seals, sea lions, and sea elephants; whales also, of the female or cow kind, abound in the offing.

22. **INACCESSIBLE ISLAND** lies nearly W.S.W., by compass, from the northern island, and is 9 leagues distant. The Blenden Hall, Captain Greig, on her voyage from London to Bombay, in 1821, was totally lost on Inaccessible island, and eight of the crew perished. The island is about 9 miles long, well wooded, and remarkably high, so much so, that it is a day's work to attain the summit; it is constantly enveloped with clouds, and visited with squalls; it has no harbour or cove, and can be landed on to leeward only,—a heavy swell constantly prevails. **NIGHTINGALE ISLAND** bears S. 33° W. distant 8 leagues from Tristan d' Acunha. The three islands are high, rocky,

and steep-to; off the south end of the smallest island a reef of rocks runs out a considerable way, but no other danger is known about them; there is no safe anchorage, but deep water channels between them all.

REMARKS BY JAMES HERD, COMMANDER OF THE BARQUE ROSANNA. *Nautical Magazine for* 1832, *page* 340.—"The latitude of Tristan d' Acunha was ascertained by observations taken on shore, by the artificial horizon, as was likewise the time for chronometers, within one hundred yards of Cascade point. From this point Inaccessible island bears, by compass, S. 63° W., distant 20 to 21 miles; from the S. W. point of Tristan island, Nightingale island bears S. 28° W.; from Cascade point to the S. W. point, the coast lies S. W. by S., and N. E. by N., about 4 miles. When I touched here in 1821, our chronometers made the longitude (from Rio Janeiro) a few miles more to the Westward, or in 12° 5′ W. The variation in 1825 was 10° 59′ W.

"Were Tristan d' Acunha better known it might be of great service to ships bound to India, and particularly to New South Wales, as water is very easily obtained, and also live stock and vegetables of every description. With the wind from West, round by South to N. N. E., in moderate weather, ships can always lie within two miles of the watering-place. The only winds that render it inaccessible are those from North to W. N. W., and these are generally of short continuance; so that, rather than put into the Cape, or Rio, it would save time and expense to get refreshment at this place. On making the island, if the wind was from the northward, I would haul off to windward of Inaccessible island, and lie there until the wind backed to W. S. W., which at the longest duration will not be more than two or three days. This I did in 1825, when we took on board 20 tons of water, two bullocks, twelve sheep, six pigs, several dozen fowls, and thirty hundred-weight of potatoes and vegetables, which served all hands as long as they would keep good. Had the people on shore a hose, the water might always be filled without taking the casks out of the boat, or even bringing her into the surf."

EXTRACT OF A LETTER, SIGNED ALBERT, DATED LIVERPOOL, NOV. 18TH, 1833.—"Mr. Glass (generally styled Governor) has cut a trench from the run of water that forms the "Cascade," from which a hose is attached, and fills the water in the cove. However, if there be any swell running, the best way is to *raft* it, as there is no inconvenience arising from the seaweed, beyond an oar fouling occasionally. Observe, also, that the current generally sets to the E. N. E. The ship ought to keep the cascade to the eastward of south, to enable the boat to fetch the cove with the raft, (supposing the wind westwardly;) and when the boat is returning, and has got a sufficient offing, to run down inside of her, and receive the raft with the head off shore. The people on the island will cheerfully render all the assistance in their power.

"The market prices in March last, which were furnished me by Mr. Glass, at the same time assuring me that a plentiful supply might be had, were as follow:—A milch cow and calf, £8; sucking pigs, 2s. 6d.; potatoes, 8s. per cwt.; grown pigs, 10s. and 12s.; beef, 3d. per lb.; sheep, 15s. to 20s.; fowls, 18s. per dozen; geese, 5s. each." *(Nautical Magazine for* 1834, *page* 45.*)*

23. LENNON, OR HIBERNIA REEF, was seen by Captain Lennon, of the Hibernia, in April, 1817, on his passage to India. When clear of the island of Trista d' Acunha, he steered E. by S., with a fair wind, until half-past 11 *a. m.* of the 12th, (April) then in latitude 37° 31′ S., longitude 4° 42′ W., ship going at the rate of 7 knots an hour,—perceived a sunken rock close on the larboard bow,—bore up immediately, and with great difficulty escaped running on it. The part or end that at one time was close

alongside I could very distinctly perceive. The rock was about 9 feet under water, and at the distance of about one hundred yards, where I suppose the rock was nigher the surface, there appeared fields of weed growing from the rock. On taking a good look out all round, we could perceive two other rocks.

24. ROBSON'S REEF. *Extract from the Log of the Barque Ann, from Liverpool, towards the Isle of France,* 1829, *Captain W. W. Robson.* "Monday, 12th October. Made Trista d' Acunha, the longitude by chronometer exactly agreeing with Captain Heywood's. Sunday, the 18th, at 9 h. 30 m. *a. m.*, saw on the lee bow what was at first supposed to be whales, but, when a short distance from them, discovered them plainly to be rocks, the highest part about 8 feet above water; luffed, and cleared them by about 50 yards. The sea broke heavy on them, and there was tangle 8 or 9 feet long growing on the rocks. They are about 50 or 60 yards long, something of a horse-shoe shape, with the opening to the S. E."

In allusion to the above-mentioned reef, CAPTAIN JAMES LIDDELL, of the ship Wellington, in a letter addressed to the *Editor of the Nautical Magazine*, dated December 2nd, 1835, says, "I take this opportunity of alluding to a notice contained in your December number, 1833, respecting a 'crescent rock,' seen by Captain Robson, in the barque Ann, on the 18th October, 1829, in latitude 37° 35′ S., 7° 30′ E. longitude. I confess I was exceedingly surprised when this account first met my eye, as, on reference to my journals, I found I had twice passed nearly over the very spot in the day-time. But, sir, when it is considered that this 'crescent rock' is situated not only in the direct route of all the outward-bound vessels to the eastward, but also in the very cruising parallel of the American whalers, whose number yearly frequenting that part of the ocean exceeds 300, may we not be permitted to suspect, with that able and indefatigable hydrographer, Horsburgh, 'that dead whales, shoals of devil-fish, and other huge marine monsters,' are still sometimes mistaken for banks and rocks. Three years ago, within a short distance of the reported site of this 'crescent rock,' we saw at one time around us *six* American whalers." *(Nautical Magazine for* 1836, *page* 340.*)*

25. TELEMAQUE ROCK. This danger seems to have been first observed by Captain Geraud, of the French brigantine Telemaque, who states, that not only was green moss and grass seen upon the rock, but in some places the bare rock appeared perfectly distinct and plain on both sides of the vessel. Subsequent navigators seem to agree as to the existence of this danger, though it has been much doubted by others; at all events, it is generally agreed, that the correctness of the position assigned is very questionable.

26. ARIEL ROCKS. *Extract from the log-book of the schooner Ariel, of Whitehaven, Thomas Dixon, master, on her passage from Liverpool to Valparaiso, December 22nd,* 1827. "At 11 h. 45 m. *a. m.*, moderate breezes from the N. E., steering S. S. W. by compass, saw something of a reddish appearance, a little above water, at about a quarter of a mile distant. Hauled in for it, sounded, and obtained bottom at 47 fathoms, fine grey sand. The object seen was about 6 feet above the water, and 20 or 30 feet in circumference, but more extensive underneath. When close to, we saw another head, at about 2 or 3 cables' length to the N. E. of the first, also of a reddish appearance. The sea was breaking over them with a noise; there was some sea-weed, and a number of sea-birds about them. These dangerous rocks lie in the general track of vessels round Cape Horn, to the west coast of South America. The latitude was obtained by a good meridian altitude of the sun, and the longitude by good lunar observations

taken that day, and by chronometric observations." *(Nautical Magazine for* 1832, *page* 115.*)*

27. GOUGH ISLAND. This island is about 15 or 16 miles in circumference, being elevated about 4,380 feet above the level of the sea, and has some small bushy trees on it. The cliffs rise almost perpendicularly from the sea, and several beautiful falls of water issue from the chasms between them. Near the N. E. point is a rock resembling a church, with a high spire on its western end, to the southward of which, on the east side of the island, a rocky islet lies near the shore. Within this islet the landing is safe and easy, being protected by the N. E. point from the swell and northerly winds.

28. ISLE GRANDE. *Extract of a letter from* CAPTAIN A. HAIG, *of the Sir John Rae Reed, in latitude* 19° *S., longitude* 31° *W.* "On the 5th instant,* we discovered an island in latitude 46° 40′ S. and longitude 48° 35′ W. It was first seen about 4 P. M., bearing N. W., about 4 leagues distant. I hauled up a couple of points, to get a better view of it, but night coming on, and a hard gale blowing, I regret to say, I was prevented from surveying it so accurately as I could have wished. At first we thought it an ice island, but, on a nearer view, all hands were convinced of its being a rocky islet, elevated about one thousand feet above the level of the sea. A detached black rock was seen to the eastward of it. The nearest land to this that I have heard of is Isle Grande, differing very much both in latitude and longitude. There is still a possibility of our having been deceived by an ice island; but the numerous birds we were surrounded by, during the forenoon, argues strongly in favour of land, more especially as shags and divers were seen—a species of bird that is only met with where the land is near. The position of Isle Grande is said to be very doubtful." *Times Newspaper.*

REMARKS BY THE EDITOR OF THE NAUTICAL MAGAZINE FOR 1835, PAGE 1. That the island named Isle Grande, by La Roche, in 1675, has ever since that time remained absolutely unknown, throws some degree of interest on the foregoing report of Captain Haig. As there are also several reasons for supposing it was an island, and no iceberg, that was seen by this gentleman, the present seems to be a favourable opportunity for considering the subject of La Roche's long-questioned discovery.

"On the first glance over the materials we have collected, belonging to the subject, the most striking feature that presents itself is the vast extent of surface over which birds, pieces of wood, branches of trees, sea-weed, feathers, spawn, and an unusual quantity of whales, have been seen by various navigators; and it is equally worthy of observation, that this extent of the ocean, which amounts to about 700 miles, is greatest in one direction, namely about N. E. and S. W.—*that of the prevailing wind and current.*

"Isle Grande is laid down in the following meridians on the charts, in the parallel of 45°, namely, 35° 30′, 38° 30′, and 46° 30′ W.; the last according to Dalrymple, who appears to have had some strong reason for differing so much as 10 degrees from the first, which was the longitude assigned to it by Captain Cook. From conclusions so widely apart as these, we may safely infer, that the data on which they rest must be of a slender kind.

"Considering the materials before us in the order of their date, the first we come to is the account of a search for it by the unfortunate La Perouse.

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* 5th March, 1834.

This celebrated navigator reached the parallel of 44° 38′ S., in 34° W., on the 7th of September, 1785; between which time and the 27th December following, he beat to *windward*, between the latitudes of 44° and 45°, till he reached the longitude of 49° W. Perouse seems to have gladly given up his search, (although disappointed) and, while he states his conviction that the island does not exist in the part he had traversed over, he considers that the search for it should not be abandoned. He says, 'We passed sea-weed, and were for many days surrounded by birds.' But although Perouse did not find Isle Grande, he did much to forward its discovery, by proving that it does not exist in the latitude so perseveringly assigned to it by those who have considered the question of its position; and it is rather surprising that it should still have remained on the charts in the parallel of 45°.

"Colnett, in March, 1793, passed the eastern limits of the supposed position of Isle Grande, and, in latitude 40° 12′ S., longitude 34° 8′ W., he found the sea covered with feathers, birch twigs, driftwood, and sea-weed. Passing to the southward the same day, many birds and whales were seen; indeed so many of the latter, that one was pursued by his boats, and he remarks, that 'the number of whales in sight presented a fair opportunity of making a profitable voyage in the article of black oil; but my predominant object,' he adds, 'was to fulfil the particular services recommended to me by the Lords of the Admiralty.' The number of birds seen by him must have been very great, when he says, 'Had they all been on the wing together, and above us, instead of rising in alternate flocks, and skimming after the whales, the atmosphere must have been altogether darkened by them.' Colnett had imbibed the opinion of Cook, and expected to have seen the island in the position assigned to it by the 'father of circumnavigators,' and with this motive he stood to the southward, with the wind fresh from W. N. W. In his way he met with many birds, and much sea-weed, till reaching the parallel of 45°, when the whole *gradually disappeared;* and Colnett continued his voyage to the Pacific, in the hopes of being more successful on his return. This, however, was not the case, and he had no opportunity of doing more towards the discovery of its position. Colnett sounded occasionally, without success, with 200 fathoms of line.

"Vancouver also appears to have inclined to the opinion of Cook, in the position of Isle Grande, and broadly states, that 'if such land has any existence, it will be found not very far remote from the situation assigned to it by Captain Cook,—a fact,' he says, 'I was very desirous of establishing.' Vancouver was unsuccessful; but, although he did not establish it in Cook's position, he ascertained that it was not in that assigned to it by Dalrymple.

"But more light seems to have been thrown on the supposed position of this island by modern navigators; and among them, Captain Andrew Livingstone has certainly done more towards its re-discovery than any other. Indeed, the solicitude with which this gentleman has gone into the question, and the anxiety he has evinced for the safety of navigators, by his endeavours to remove the veil of obscurity by which it has been so long concealed, are highly creditable to him. In the month of June, 1824, Captain Livingstone, on his way into the Pacific, entered the questionable limits of the neighbourhood of Isle Grande, and, aware of the importance of his remarks, noted them down carefully. In the latitude 43° S., and longitude 45° 30′ W., he observed an immense number of birds, which, as he continued to the S. W., do not appear to have followed him. But, on the 7th of the same month, we find him, at noon, passing within about 20 miles of the position of the island reported by Captain Haig, *without making any such discovery.*

"On his return from the Pacific, in September, 1825, we find rock-weed noted by Captain Livingstone, a short distance to the southward of the same position in which he saw it on his way out; and on the 10th of that month, in about 45° 40′ S., and 42° 30′ W., the remarkable circumstance is mentioned by him of a lark flying on board his ship. Captain Livingstone for some time preserved his refugee, with a romantic kind of superstition, as a sure pledge that so frail and delicate a little thing must have come from land, at no great distance from him.

"Not only has Captain Livingstone supplied us with his own observations, but he has collected much information from other navigators, on the important subject before us. We learn from him, that brushwood was seen by the brig Inca, in the latitude of 43° 30′ S., and longitude 43° W.; and that in latitude 44° 45′ S., and longitude 43° 30′ W., land is said to have been seen by the Salacia. The brushwood seen by Mr. Lincoln, in the Inca, appeared to have been some days in the water, and might have drifted from the S. W., the direction in the position of which Haig's island was seen. The position of the brig Salacia from the Pacific was calculated by Captain Livingstone, and is in a S. S. W. direction from the position of the Inca, and between it and that of Haig's island; and we should also have observed, that on the same day on which Captain Livingstone caught the lark, other land-birds were seen, besides much rock-weed and tangle, all of which gradually disappeared as he proceeded to the northward.

"With the foregoing data, we have to consider the position of the island reported by Captain Haig. That an island does exist somewhere about these parts, there would seem to be good reason for supposing, or from whence can come all these indications* of land that have been so frequently seen? And, allowing that an island does exist there, unknown, and concealed from the destroyer—man, it may easily be supposed to afford ample and secure retreat for the numerous birds that have been seen thereabouts. But the probable position of it is the important point; and this involves all that we have had before us.

"We had got thus far in our investigation of the position of this island, when we found in the British Museum the work to which Dalrymple refers, as his authority for the actual existence of it. The title of it runs thus:—'Descripcion Geographica, y Derrotero de la Region Arutral Magallanica, Que le dirige, &c. Ano de 1690. Compresto por el Capitan Don Francisco, Seixo y Lovera, &c.'

"Having read the above-named work, we are at a loss to imagine upon what pretensions the island could have been laid down in the chart, more particularly, when it is known that icebergs are so prevalent, at certain seasons of the year, in that part of the ocean. The only thing certain is the derivation of the name, ISLE GRANDE, signifying a very large island; all the rest is mere conjecture.†

"Captain Haig's letter was dated in March, (1834,) and the circumstance of icebergs being met with by H. M. S. Pylades, under the command of Captain Blanckley, on the 6th of March, in latitude 37° S. and longitude 47° 30′ W., corroborates our opinion, that this was nothing more than one of them. It was reported, we believe, that there were more icebergs than usual in the South Atlantic at that time, and that they extended further north than where they are commonly found."

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* The Falkland islands are not wooded, to allow of the supposition that the branches can be from them.

† The Spanish description, with its translation, will be found in the Nautical Magazine for 1835, page 4.

29. BOUVET'S, OR CIRCUMCISION ISLAND. This island was first discovered by Monsieur Bouvet, and has subsequently been seen by the Swan and Otter, two English vessels, at different periods. The Swan, in 1808, discovered high land, and used every effort for 4 or 5 days to get close to it, without being able to get nearer than 3 miles, on account of a mass of solid ice surrounding it, and the land itself was covered with snow. Their situation was rendered very perilous at times, being beset with loose masses and islands of ice, in dark blowing weather, which forced them to depart from this inhospitable place on the 11th of October. It appeared about 5 miles in extent, east and west. The west end, which is very high land, is called Dalrymple's head, or as Monsieur Bouvet named it, Cape Circumcision. Although the Swan was prevented by the ice from approaching close to it in October, this might probably be effected in January or February.

This island was visited in December, 1832, by Captain Morrell, who observes that it lies nearly true East from South Georgia, being in latitude 54° 15′ S., and longitude 6° 11′ E., about 400 [430] leagues S. S. W. (true) from the Cape of Good Hope. We continued our course, with variable winds and occasional heavy weather, attended with much snow and hail, until Friday, December 6, when we saw the island for which we were bound, bearing E. S. E., distant one league. This was at 2 *p. m.*, and at 3 the next morning I sent the second mate with a well-manned boat to search for seal, on the shores of the island. At 7 *a. m.* the boat returned with eighty-four seals of a superior quality; and the officer reported that the seal were perfectly tame, so much so, that they would come up and play among the men who were skinning their companions. On the western shore of the island was fine anchorage, inside of an immense number of ice islands, lying from one to three miles off shore; all of them aground in from 10 to 100 fathoms of water. Some of these islands were a mile in circumference, and lay so close to each other that it was with difficulty that the vessel was gotten between them to the anchorage: but here, on the N. W. side of the island, in 17 fathoms of water, she anchored, about half a mile from shore, entirely sheltered by the ice islands on one side, and Bouvet's island on the other, from every point of the compass. On the morning of the 8th, at 3 *a. m.*, they were again sent to examine the island, and discover new rookeries; but, after sailing completely round, not another spot could be found on which a seal could land, the shores being either perpendicular, or covered by projecting cliffs.

30. L' AIGLE SHOAL is said to have been seen on the 1st of October, 1817, by Mr. R. Poole, of the ship L' Aigle. It was described as extending North and South 200 or 300 yards. The ship was then steering S. E., and about three-quarters of a mile from it, off and on steering South, about a mile and a half, had soundings in 87 fathoms.

The *existence* of this shoal is rendered very doubtful. It has been unsuccessfully sought for by Captains Jaffray, Weddell, and Lincoln; the former searched for it five times, twice in the year 1819, once in 1820, again on the 13th June, 1821, and the last time in March, 1824; he then resolved, however often he might pass, never to look for it again. Captain Jaffray says "that between the Falkland islands and the main-land, as well as in many parts of the Chinese sea, he has seen *tide-rips*, or *races*, appear like very high breakers, and perhaps no soundings at the place. The imaginary shoal of L' Aigle seems therefore to have been a *rip* of this description only. Captain James Weddell, in H. M. S. Tartar, on the

2nd January, 1823, was in latitude 51° 55′ S., and longitude 65° 7′ 15″ W., and hauled up in order to obtain a sight of the shoal; but, with a run of 14 miles, and a view of 10 from the mast-head, nothing of it was seen. Lastly, Captain Lincoln, of the brig Inca, cruised in search of it, so that if it had *existed* it could scarcely have been missed.

31. AURORA ISLES, supposed to have been first seen in 1762, by the ship Aurora, after which they were named, and again in 1790, by the ship Principassa, The corvette Atrevida, in 1794, went purposely to ascertain their *positions*, and they were then described as three, very nearly in the same meredian; the central one rather low, and the other two so high as to be seen 9 leagues off. *Positions.*—Northern isle, latitude 52° 37′ 24″ S., longitude 47° 43′ 30″ W.; Middle isle, latitude 53° 2′ 40″ S., longitude 47° 55′ 30″ W.; Southern isle, latitude 53° 15′ 22″ S., longitude 47° 57′ 30″ W. From the credibility of the documents Captain Weddell was induced, in 1820, to make a strict search for the islands, the particulars of which he has given at large. He traversed in every direction, but nothing like land, even in fine clear weather, was to be seen; at last he says, 'the only chance now left us for finding these Auroras, I conceived, was by making various courses between the latitudes of 53° 15′ S., and 52° 57′ S.; and this we did, till we reached the longitude (by chronometer) of 46° 29′ W. Having all this time seen nothing resembling land, excepting fog banks, which had often given us severe disappointment, we returned westward, and on the 5th of February, at noon, our latitude was 55° 44′ S., and longitude 48° 33′ W. We had thus again passed over the site of these islands to no purpose. On the 6th, our latitude, by observation, was 53° 24′ S., and longitude, by chronometers, 49° 29′ W. We continued to stand to the westward, under easy sail, with the wind northerly; and on the 7th, our latitude, by observation, was 53° 33′ S., and longitude 51° 5′ W. Having thus diligently searched through the supposed situation of the Auroras, I concluded that the discoverers must have been misled by appearances; I therefore considered any further cruise to be an improvident waste of time, and, to the gratification of my officers and crew, directed our course to the Falkland Islands."

The islands have since been sought for by Captain Morrel, Captain Biscoe, Captain Johnson, of New York, and others, but with no better success; and of their *non-existence* there seems no longer to be any doubt.

32. THE SHAG ROCKS are said to be even with the water, but Captain Weddell says, "this I believe not to be the case, as I have been credibly informed that they appear in three pinnacles, or in the shape of sugar-loaves, 60 or 70 feet high, with a reef running around them. These reefs, I presume, have given rise to the supposed existence of the Aurora islands."

33. KAIN'S ISLET is said to have been passed in November, 1828, by the Kains transport, Lieutenant T. Burdwood, agent, in her passage from Rio Janeiro to Valparaiso. The *existence* of such a rock had been reported by the Spaniards in 1813, but was considered as doubtful. Should this islet *exist*, it must lie about 120 miles south from the Falkland islands,—a tract of sea frequently traversed by Captain Weddell and others.

34. POTTINGER'S BANK was passed over on the 5th of January, 1822, by Captain Pottinger, of the brig Tartar, of London, on his passage from South Georgia to South Shetland, in latitude 54° 36′ S., longitude 57° 49′ W., soundings, 65 fathoms, coral rocks, with sea-eggs and shells. He supposed that he had passed over a considerable and much shoaler part of it before daylight, judging by the agitated state of the sea.

35. ISLANDS OF ALEXANDER AND PETER were discovered by the Russian Captain, Bellinghausen, in 1821. Two frigates under this commander, it appears, were employed on a voyage of exploration, and penetrated to the 69° of South latitude, but were unable to proceed further. The particulars of this voyage have not been made known.

ICEBERGS. Captain Horsburgh observes, that icebergs off the bank of Cape Agulhas probably have been the cause of the loss of some missing ships; for Captain Milchior, of the French ship Harmonié, has given an extract from his journal of the 7th April, 1828, stating, that in latitude 31° 50′ S., longitude 15° 45′ E. from Paris, he fell in with several clusters of icebergs, some of which appeared to be more than two cables' length from the nearest large pieces of ice, upon which the sea broke violently. If this statement be correct, it is very remarkable that icebergs should have been found in the situation here given; for, hitherto, none appear to have been seen to the northward of latitude 44° or 45° S., in the Southern Ocean, near the longitude of the Cape Bank; and that these icebergs should have been seen early in April, or in the autumn of the southern hemisphere, when the sea ought to be clearer of ice for a greater distance to the southward than at any other season, renders this statement of Captain Milchior's still more surprising.

THE FALKLAND ISLANDS.

THE FALKLAND ISLANDS, (by the Spaniards called the MALUINAS) form a group or cluster of nearly ninety islands, extending north and south from latitude 50° 58′ to 52° 46′ S., and east and west from longitude 57° 32′ to 61° 29′ W. They were first seen in 1592, by Captain Davis, who sailed under the command of Sir Thomas Cavendish, and two years afterwards by Sir Richard Hawkins. They were afterwards successively seen by other navigators, such as Dampier, Cowley, Strong, &c. The latter gave them their present name, in honour of Viscount Falkland. There is no appearance whatever of these islands having ever been inhabited previous to their discovery by Europeans; and the navigators who first landed on their shores found the animals so totally unacquainted with man, that the birds suffered themselves to be taken by the hand, and even settled upon the heads of the people.

The first attempt at settling in these islands was made by the French, after losing Canada, in 1763, who selected them as a place of shelter and refreshment for vessels bound to the South Seas. For this purpose they established a little colony on the eastern island, at Berkeley Sound, which they denominated the Bay of Acheron. Two years afterward, the British took possession of these islands, and settled a colony in Port Egmont. But neither attempts succeeded. The French ceded their settlement to the Spaniards in 1767; and the English abandoned theirs, as useless, in 1774. The Spaniards seem to have made no use of them, other than as a place for the transportation of convicts. In the month of November, 1820, Commodore Jewitt, then commanding the *Heroine* frigate, took formal possession of the islands, in the name and by the authority of the *United Provinces of South America*, or government of *La Plata*, otherwise *Buenos-Ayres*.

After these islands had been abandoned by the Spaniards, they remained unoccupied until the year 1825, when *Don Louis Vernet*, a German by birth, resident in America from his youth upward, was induced to visit and inspect them, with a view of settling there. Having matured his plans, he returned, and made application to the government of La Plata, upon which he had certain claims, for a grant of them to him. He partially succeeded, and this government made over to him the eastern island as his property for ever, with entire and sole right to all its soil, cattle, horses, hogs, fisheries, &c., and he consequently formed a settlement upon it. Subsequently, however, the settlement was abandoned by its proprietor, who, however, left a remnant of the population, under the superintendance of Mr. Matthew Brisbane.* In December, 1832, the sovereignty of the islands was disputed by the government of Fredonia, as to the right of La Plata; and while the dispute was contested, the islands, under an order of our government, were taken possession of by Commodore Onslow, of H. M. S. Clio, who left a small party at Port Louis, under a Mr. William Dickson, for the protection of the British flag; but, unfortunately, without adequate protection for them and the people left by Mr. Vernet. And it appeared, by a dispatch, dated November, 1833, that eight gauchos† and Indians, of bad character, on the 26th of August, in that year, had attacked and murdered Mr. Brisbane, Mr. Dickson, and three other principal persons; after which they pillaged the houses, plundered the place of whatever it contained, and drove off all the cattle and horses up the country, laden with their booty. Thirteen unarmed men, three women, and two children, remained in the town two days with the murderers,‡ and then escaped to the islands in the bay, where, until relieved, they lived upon eggs only. On the return of a party which had left the settlement, for the purpose of sealing, it was found, on examination, that all the trunks and boxes had been broken up, and every article in the houses ransacked and cut to pieces. The bodies of Mr. Brisbane and others were found, and the English jack was again hoisted.

At the beginning of the year 1834, Lieutenant H. Smith, R. N., was appointed governor of these islands, accompanied by a small party, as the nucleus of a future colony. The old settlement, at the head of Berkeley sound, was fixed upon, as the head quarters. It was estimated, this time, that 7,000 head of fine wild cattle, and 500 wild horses, were roaming over a large expanse of most excellent pasturage. "In one point of view, these islands present to the English a most important feature. It has hitherto been the custom, for almost all vessels returning home from the colonies of New South Wales and Van Dieman's Land, to put into Brazil for refreshments. This takes them out of their direct track, causes great loss of time, and is done only by incurring such expenses as very materially lessen the value to the owners of the ships' cargoes. But the eastern island lies in the direct track of every ship, after she has doubled Cape Horn. It possesses a beautiful harbour, of easy access, where can be obtained excellent water, fine beef, good vegetables, and, in case of the illness of seamen, plenty of the finest antiscorbutic grasses." The two main islands are now denominated the EAST AND WEST FALKLANDS. The western island is the *Grand Maluina* of the Spaniards, and the eastern the *Soledad* of the French. FALKLAND SOUND, which separates these islands, is from 7 to 12 miles broad, and it contains many islets; but, by attention to the chart, it may be navigated with safety. Its harbours are safe and commodious.

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* This gentleman was the friend and companion of the respected Captain Weddell, in his enterprising voyage of 1822, 3, and 4. He then commanded the cutter Beaufoy.

† The country peasants of South America, celebrated for their horsemanship, and for the use of the *bolos* and the *lasso*, with which they catch wild horses and other cattle.

‡ They were ultimately taken, and sent for trial to Buenos-Ayres.

EAST FALKLAND ISLAND. *M. Louis Vernet*, whose name has been already noticed, the public are indebted for the following description, which was communicated to the Royal Geographical Society, by *Woodbine Parish, Esq., F. R. S.*, 14th January, 1833. EAST FALKLAND ISLAND is favourably situated, both for colonization, and for the refreshment of vessels bound round Cape Horn. Its proximity to the Cape, and its excellent harbours, most of which are of easy access, with good holding ground, and sufficient depth of water for even first-rate men-of-war, would alone make it a valuable possession; whilst the facilities it affords for exercising ships' companies ashore, without the risk of losing them, together with the abundance of wild cattle and antiscorbutic herbs found there, point it out as a most desirable resort for ships which have been long at sea, and whose crews are threatened with scurvy.

The climate on the island is, on the whole, temperate. The temperature never falls below 26° Fahrenheit in the coldest winter, nor rises above 75° in the hottest summer; its general range is from 30° to 50° in winter, 50° to 75° in summer. The weather is rather unsettled, particularly in winter; but the showers, whether of rain, snow, or hail, are generally of short duration, and their effects are never long visible on the surface of the ground. Thus, floods are unknown; snow disappears in a few hours, unless on the tops of the mountains, and ice is seldom found above an inch thick. Thunder and lightning are of rare occurrence; fogs are frequent, especially in autumn and spring, but they usually dissipate towards noon. The winter is rather longer than the summer, but the difference is not above a month, and the long warm days of summer, with occasional showers, produce a rapid vegetation in that season.

The wind blows commonly from the N. W. in summer, S. W. in winter, and seldom long from the eastward in either season. The finest weather in winter is when the wind draws from the W. or N. W., and, in summer, when it stands at N. W. or N. E. A north wind almost always brings rain, especially in summer; and E. and S. E. winds are constantly accompanied by thick and wet weather. Snow squalls generally come from the S. S. E.; South, or S. S. W. storms are most frequent at the changes of the seasons, and blow commonly from S. S. W. to W. S. W., but they seldom last above 24 hours.

The soil of East Falkland island has been found well adapted to cultivation, consisting generally of from six to eight inches of black vegetable mould, below which is either gravel or clay. Wheat and flax were both raised, of quality equal, if not superior, to the seed sown, which was procured from Buenos-Ayres; and potatoes, cabbage, turnips, and other kinds of vegetables, produced largely, and of excellent quality. Fruit-trees were not tried, the plants sent from Buenos-Ayres having perished before they arrived.

The soil also produces different kinds of vegetables wild, as celery, cresses, &c., and many other esculent plants, the proper names of which were not known to the settlers, but their palatable taste, and valuable antiscorbutic properties, were abundantly ascertained by them. Among others is one which they called the tea-plant, growing close to the ground, and producing a berry the size of a large pea, white, with a tinge of rose-colour, and of exquisite flavour. A decoction of its leaves is a good substitute for tea, whence its name. It is very abundant.

No trees grow on the island, but wood for building was obtained, tolerably easily, from the adjoining Straits of Magellen. For fuel, besides peat and turf, which are abundant in many places, and may be procured dry out of the penguins' holes, three kinds of bushes are found, called fachinal, matajo, and gruillera. The first of these grows straight, from two to five feet high, and the stem, in proportion to the height, is from half an inch to one inch and a half in diameter: small woods of this are found in all the valleys, and form good cover; it bears no fruit. The second is more abundant in the southern than in the northern part of the island; its trunk is nearly the thickness of a man's arm, very crooked, never higher than three feet, and bears no fruit. The gruillera is the smallest of the three, growing close to the ground, and abundant all over the island; being easily ignited, it was chiefly used as fuel, when the people were away from the settlement, and to light the peat-fires in the houses. It bears a small dark red berry, of the size of a large pea, of an insipid taste.

The country, in the northern part of the island, is rather mountainous. The highest part was called San Simon, at no great distance from the bottom of Berkeley sound. The tops of the mountains are thickly strewn with large boulders, or detached stones, of which quantities have fallen, in some places, in lines along their sides, looking like rivers of stones; these are alternated with extensive tracts of marshy ground, descending from the very tops of the mountains, where many large fresh-water ponds are found, from one to two feet deep. The best ground is at the foot of the mountains, and of this there is abundance fit for cultivation, in plains, stretching from 5 to 15 miles along the margin of the sea. In the southern peninsula there is hardly a rising ground that can be called a hill. Excellent fresh water is found everywhere, and may be procured either by digging, or from the rivulets, which flow from the interior towards the sea, through valleys covered with a rich vegetation.

Herds of wild horned-cattle exist on the island, sufficient to maintain a great many settlers, and wild hogs are abundant in the northern peninsula; wild horses are also found there, of small size, but very hardy, which, when broken in, as some were without difficulty, were found of great service to the settlement. Rabbits are in great numbers, of a large size, and fine fur. Foxes too are found, but differing considerably from those of Europe, having a thick head and coarse fur; they live chiefly on geese and other fowl, which they catch at night when asleep.

Game is extremely common, especially wild geese and ducks; of the former two kinds were distinguished, the lowland or kelp geese, and the upland geese; the latter were much superior in flavour, the former being of a fishy taste, living chiefly on mussels, shrimps, and kelp. Both were very tame, and the upland geese were easily domesticated. They are finest eating in autumn, being then fattest, in consequence of the abundance at that season of tea-berries, of which they are very fond; the rest of the year they live on the short grass. They have a white neck and breast, with the rest of the body speckled of a fine brown marbled colour. The lowland gander is quite white, and the goose dark, with a speckled breast.

Of ducks there are several kinds. The loggerheaded are the largest, and almost of the size of the geese; their flesh is tough and fishy; they cannot fly, and when cut off from the water are easily caught. The next size is also of inferior quality, tough and fishy; but the smaller kinds, which are not larger than young pigeons, are deliciously good, and are found in large flocks along the rivulets and fresh-water ponds. Snipes are found so tame, that they were often killed by throwing ramrods at them. In addition to these, a great variety of sea-birds frequent the shores, of which the most valuable to sailors and settlers, from the quantity of eggs they deposit, are the gulls and penguins. These birds have their fixed rookeries, to which they resort, in numerous flocks, every spring; the gulls generally in green places near the shore, or on the small islands in the bays; the penguins chiefly along the steep rocky shores of the sea. The eggs of both are eatable, even with relish, after long confinement on board ship,—the penguin's being, however, the best, and less strong than that of the gull. So numerous are these eggs, that on one occasion eight men gathered 60,000 in four or five days, and could easily have doubled that number, had they stopped a few days longer. Both gulls and penguins will lay six or eight each, if removed; otherwise, they only lay two, and hatch them. The gulls come first to their hatching-places, the penguins a little later.

Fish abounds in all the bays and inlets, especially in spring, when they come to spawn at the mouths of the fresh-water rivulets. They generally enter and retire twice every day, at half-flood and half-ebb, and are in such numbers, that ten or twelve men could always catch and salt about sixty tons in less than a month. They were usually caught by a sweeping-net, but they also took the hook, being of a kind between the mullet and salmon. Their flavour was excellent, and when salted, they were considered superior to the cod;—many ship-loads might be procured annually.

Of shell-fish there are only mussels and clams; they are very abundant, and easily gathered on the beach at low water.

Seals are found on the island, or rather on the rocks close to it; and hair-seals (lions and elephants) abound along its shores. Many black whales have been also caught in its neighbourhood, in consequence of which, the island has of late years been much resorted to by fishing-vessels—English, American, and French; of these eighty-nine touched at it between 1826 and 1831.

"Vessels approaching Berkeley Sound, from the northward, should endeavour to make the land 10 or 15 miles west of the port, the prevailing winds being westerly; and when approaching from the southward, should, in like manner, make allowance for the currents, which frequently run very strong to the northward. *When entering the Sound*, a sufficient berth must be given to a ledge of rocks, called the Volunteer rocks, which run out from the north point about a mile and a quarter; outside of which, in nearly the same line, at a further distance of about another mile, is a single sunken rock, with only six feet on it at low tide. When these rocks are cleared, and the sound is fairly entered, there is no danger, except from a small ledge of rocks off Eagle point, about two cables' length from the shore, with kelp growing all over it, and therefore easily seen. Above this point the sound is quite clear till well up, when a ledge of five or six black rocks will be seen on the north side, behind which is an excellent harbour, called Johnson's harbour, with good holding ground in 6 or 7 fathoms, and greater convenience for watering than in any other part of the bay.

"If a ship, endeavouring to enter Berkeley sound, find the wind blowing hard down, which is often the case, and is thus prevented getting to a suitable anchorage in the bay, a good port exists immediately south of the sound, and about 2½ miles from the small islands in its mouth, called Port William, or Harriet's bay. This is of easy access, and fresh water may be easily obtained in it. In going in, ships should keep on the north shore, about two cables' length distant, as the tide runs strong. The flood runs to the southward, and the ebb to the N. E."

To the south of Berkley sound, the coast of East Falkland island should not be approached too near, particularly in thick weather, there being no correct chart of it, and many low and dangerous islands lying off, some of them even out of sight of the land, particularly to the southward.

Remarks by Mr. Edward Gulliver, Master R. N. "Berkeley

Sound is easily made out by the breadth of the entrance, which is plainly visible some miles at sea. Off Cape St. Vincent are the Volunteer rocks; and a sunken rock, on which a French corvette struck, is said to lie about N. E. by E. three quarters of a mile from the Volunteer rocks; therefore a good berth should be given to it, when hauling round into the sound. There are also some rocks off Cape Pembroke, the southern point of the sound; they extend about one mile and a quarter out from the point; but when within the points, the sound, for about 7 miles, is perfectly clear, and may be worked up without danger. Be careful not to stand too close to Cape Nelson, off which some rocks lie. After working up about seven miles, the Sea Lion islands, or rocks, will be seen, with a patch of kelp about them, that extends to the point they lie off; and also to the southern end of them, and nearly midway between the Sea Lion islands and the east point of Goat island, another large patch of kelp will be seen, on each side of which there is a passage; but be careful not to get in among the kelp,* as many dangers unknown may exist among it. In H. M. S. Tyne, we worked in, blowing fresh between the Sea Lion islands and this patch of kelp, and tacked entirely by our approach to the kelp on each side. We worked up as far as to bring the eastern extreme of Goat island to bear S. E.; small island of Ellice island, West; kelp in midway, East; and the Sea Lion islands, E. N. E., when, in consequence of not thinking it prudent in so large a ship to work up any further, we anchored in $\frac{1}{4}$ less 9 fathoms, good holding ground, and gave her good scope of cable.

"With a fair wind, a ship may safely run inside all the islands, taking care to keep Goat island on the larboard hand, when a good berth may be picked up in 5 fathoms, mud, with the settlement of Port Louis bearing W. N. W. one mile; western point of Ellice island, N. E.; and western point of Goat island, S. E. Although this anchorage is handy for the watering-place and settlement, in S. W. gales, it is not so smooth as the anchorage we had in the Tyne; but I would not, on any acconnt, recommend any square-rigged vessel, larger than a ten gun-brig, working up further than we did in the Tyne.

"Water may be had at the settlement, by sending on shore your water-casks, and filling them. Cattle are plentiful here, and may be obtained in any numbers, by giving the guachos twenty-four hours' notice: the price we paid was ten dollars a head. The same abundance of wild ducks, geese, and snipe as at Port Egmont. There are also a great number of wild horses in East Falkland.

"Falkland Sound, so called, being the channel between the two principal islands, East and West Falkland, is easily made out, by a very remarkable rock, called the Eddystone, which lies about 4 leagues N. by E. from White Rock point, and W. by N., 6 miles, from Cape Dolphin. It may be seen from the deck, in clear weather, 5 or 6 leagues. It makes, at first, something like a sail, and appears to be pretty bold all round. The land also, half-way between Cape Dolphin and the eastern entrance of the sound, is rather high and rugged; and White Rock point is also remarkable, from some white rocks that lie off it: it is the western point of the entrance into the sound. The soundings, off the entrance of the sound, are laid down very correctly in Lieutenant Edger's chart, but his distance between Keppel Island Keys and the Eddystone is very much out. In H. M. S. Tyne we measured it, and made it as near as possible 35 miles, when Lieutenant Edger makes it 52 miles in his chart. I also make the latitude of the Eddystone 51° 10′ S., which is about 6 miles further north than laid down in the charts. West Falkland island is generally higher than the East, and both are very uneven, and the land much indented." *Nautical Magazine*, 1834, *page* 388.

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* The following extract, from Captain King's directions for the Straits of Magellan, will give the reader a correct idea of the dangerous nature of kelp.—"With daylight and clear weather, a vessel may close the shore without risk, because the water is invariably deep, and no rock is found, which is not so marked by sea-weed, (or kelp, as it is generally called) that, by a good look-out at the mast-head, its situation is as clearly seen as if it were buoyed. By avoiding kelp, you are sure of having sufficient water for the largest ships on any part of this coast. At the same time it must be remembered, that kelp grows in some places from a depth of 30 fathoms, and that, on many parts of this coast, you may pass through thick beds of sea-weed without having less than 6 fathoms water. Still it is always a sign of danger, and, until the spot where it grows has been carefully sounded, it is not safe to pass over it in a ship. As an instance:—After sounding a large bed of this weed, in one of the Beagle's boats, and thinking it might be passed safely, a rock was found, not more than 4 feet in diameter, having only one fathom water over it."

The WESTERN ISLANDS are very high, and in fine weather may be seen 50 miles off. The tops are entire rock, the lower parts rich and productive. On the S. E. side of the Grand island, and at some few miles in the interior, natural curiosities are met with in the huge amphitheatres, large caverns, &c., in which beautiful specimens of stalactites have been found, which sufficiently prove the presence of lime in the country. Winds from the west and north are said to be the only check to agricultural labours. These winds, more or less, during the summer months, blow with great violence, from soon after sunrise till sunset.

REMARKS BY CAPTAIN GRANT, COMMANDER OF THE LADY NELSON. "On the 21st of January, 1802, we came safely to an anchor in Hope bay, or Little West Point harbour, in the N. W. It was our intention, at first, to touch at a cluster of islands to the westward, called NEW ISLANDS, by the Americans, who are the most constant visitors of Falkland Islands. On New Islands are found plenty of goats and hogs. They lie about 30 miles S. S. W. by compass from West Bay, as a N. N. E. course carried us from them clear to the entrance of West Point. They are distinguished by a particular saddle-island and a bluff, standing separately from each other. They are a little to the northward of Beaver island, and may be easily found by the two remarkable islands just mentioned. As it is of the greatest consequence to mariners, when in want of water or refreshments, to obtain every possible information, in order to secure a port amongst this foul-weather group of islands, which purpose may be defeated by the smallest oversight, I think that a few remarks made in the run may not be unacceptable.

"Having made New Islands, the westerly wind, which generally prevails, blowing very strong and in squalls, would not permit us to anchor; we were, therefore, under the necessity either of making the harbour of West Point, or running in the night through a passage among the Jasons, well known to be full of rocks and shoals, many of them not laid down in any chart. I have before observed, that, thirty miles, N. N. E., by compass, brought us to the entrance of West Point harbour. In this run there are, on the right hand, a few small flat islands, called Pass islands. These ought to be kept on board, near enough to see the surf breaking on them; and, soon after, a remarkable island, with a steep side, will present itself, having the appearence of a split in the middle, which has given it the name of Split island.

"The split must be brought to bear S. by W. in running in, and N. by E. in coming out; observing this, a vessel will find itself in the fairway; and right ahead coming in, or right astern going out, a sight will be had of West Point entrance, making at first like three hummocks, to the right of which is the mouth of the harbour. The small harbour on the left is preferable to the larger one on the right, though anchorage may be found in both; but fresh water may more readily be had in the little harbour Both these together form nearly an oval, divided by the passage which runs directly through where the tides of flood and ebb alternately enter. A vessel must therefore haul close round the rocks on the south side, to get into the little harbour for the ebb tide, with which she must go in, unless it blows very strong, so as to enable her to stem the flood, both tides running here with great rapidity, and when it blows hard, raising a confused sea. There is a sandy beach at the top of the harbour, off which a vessel may choose her depth of water to anchor in. In going out of the harbour the northern passage is most eligible; and a westerly wind, with a course N. by E., by compass, will carry a vessel out, provided she get under-weigh, at the first of the ebb.

"Five small perpendicular rocks, called the Needle Kays, appear when out, standing together, bearing N. E. by E., or thereabout, from the harbour's mouth. It is best to leave them on the right; but should there be little wind, and the tide strong, as was the case when we passed them, a vessel may go close to the right of them. The tide must be attended to, as it runs strongly betwixt them. The bottom is very foul, so that if an anchor is let go, it is a chance if it be ever recovered; and should the wind continue light, the tide of flood making, a vessel may anchor at Sedge island, if she can get as far down, where 10 fathoms of water will be found, with a sandy bottom, within two or three miles of the shore. From Sedge island a N. by E. course will carry a vessel clear out to sea.

"It is proper to observe here, that if a vessel is obliged to leave the Needle Kays on her left hand, the nearer she keeps to them the better, and even to haul over on the larboard side, after she is past, as she will have the more room to weather a ledge of rocks, lying at a considerable distance out from Saunders' point, as is shown in Lieutenant Edgar's chart. This passage is much preferable to running through the Jasons.

PORT EGMONT, on the north side of the great island, may be descried at some distance from the sea, and may be entered by steering S. E. by S., which will lead in safely. On advancing, you will pass two rocky islets, which lie about 9 miles N. N. W. from the entrance; by passing within half a mile of the western side of these, the course in will be about S. S. E. ½ E. The harbour is spacious, even to a fault; for its great size, during strong winds, renders communication with the shore inconvenient. The best anchorage is immediately off the creek, at the foot of the ruins, bearing N. N. W., in 9 fathoms of water, about three-quarters of a mile from shore. A reef extends from the east point of the creek, but may be known by the kelp which grows upon it. The ground is, however, so tough that the anchor will not be raised without great labour. The best watering-place in this port is at the head of the creek, and the most expeditious method of obtaining water is to fill the casks at low-water mark, and raft them off to the vessel. The tide, on the full and change, flows at 10 minutes past 7, and rises about 9 feet.

REMARKS BY MR. EDWARD GULLIVER, MASTER R. N. "PORT EGMONT is situated on the north side of the island, in a fine and spacious harbour, but difficult to be made out when first coming in from sea. The entrance may be known, in clear weather, by two small islets or kays, called by sailors who frequent that port, Keppel Island Kays. They are about nine miles N. N. W. from the entrance; but, in consequence of the very thick fogs that prevail, and always with any wind that has nothing in it, they are difficult to be made out. They are to be left on the larboard hand going in. There are also two other low islands, that lie about W. N. W. 10 miles from Keppel Island Kays, called Wreck and Ledge islands, and are always to be left on the starboard hand going in.

"The course into the harbour, after passing within a mile of the Keppel Island Kays, on the western side, is about S. S. E. ½ E. There is no difficulty or danger in running for the harbour, after you have once got hold of the kays, by steering the above course, until you get within the points of the entrance of the harbour, where a sunken rock is laid down in Lieutenant Edgar's chart, just within the points, and nearly midway between them; but its existence appears to me to be doubtful, as I went away, sounding at low water, for the purpose of ascertaining its position, but could not find it, although I stretched across from point to point, and from kelp to kelp, off both shores, and found plenty of water, 7 fathoms close alongside the kelp on either shore, and gradually increasing to 16 and 17 fathoms, mid-channel.

"There appears to be anchorage in every part of the harbour. The best is with the ruins of the old settlement bearing N. N. W., (they are just round the first point on your starboard hand, when within the harbour) and the watering-place W. by S., in about 9 or 10 fathoms water, good holding ground, and distant from the shore about half a mile. We anchored in H. M. S. Tyne, with the above bearings, in 11 fathoms, stiff mud, and rode out a heavy gale, without driving.

"Water may be obtained here by sending on shore your water-casks and filling them, and either rafting them off, or parbuckling them into your boat as you please. There are also abundance of wild ducks, geese, both upland and kelp, and also snipe, to be found here. There is also an abundance of fish to be caught here with the seine; in one haul, we got a sufficiency for one ship's company.

"The rise and fall of the tide at Port Egmont is about 9 feet; and it is high water, full and change, about 7 o'clock. I made Port Egmont, by mean of three chronometers, rated only three weeks before at Fort Vilganhon, Rio, to be in longitude 60° 15′ W., which is about 34 miles to the westward of where Lieutenant Edgar places it.

"The coast between Keppel Island Kays and the entrance into Falkland sound is pretty bold, having sailed in H. M. S. Tyne twice along it, and at the distance of forty-five and six miles from the land, without discovering any thing like broken water. I should therefore recommend a stranger working up from Falkland sound to Port Egmont, to stand within 3 or 4 miles of the shore, and not too far off, when he will have no difficulty in making out the islands that point out the approach to Port Egmont, as they are the first islands that are made in going to the westward from Falkland island." *Nautical Magazine for* 1834, *page* 387.

West Point Harbour is the next principal anchorage to Port Egmont, situated at the western extremity of the southern land of Byron's sound. There are two passages into it, one on the north, and the other on the south. The *Jason Islands*, lying to the N. W., are much in the way of the former, and these islands must be cautiously avoided in the night, and in unsettled weather, as the tide runs so strong and irregular amongst them as to render a ship almost unmanageable. The *southern passage* to West Point harbour is easily made, by being careful, when coming from the westward, to haul close round West Point island, so as to enter with it on the larboard side; for, by neglecting this precaution, with the wind from the westward, you may fall to leeward of the passage, and find it difficult to work out of the lee bays, into which a heavy swell frequently rolls.

The best anchorage in West Point harbour is abreast of a small cove, on the south side, in 5 fathoms, over a bottom of sand and mud. The stream of tide here is scarcely perceptible, although it rises about 9 feet by the shore, and flows, on full and change days, at 7 *h.* 30 *m.* Water may be obtained at the head of the cove; and at the head of the harbour there is also a run of water, in which mullets may be caught by constructing a fish-weir. Water is abundant during the spring and autumn, not only here, but at Beaver island, to the S. W., and at Little Port Egmont, in the west side of the passage to the greater port of the same name. At the west end of West Point island is a rookery of the small albatross, which in October affords a good supply of eggs. Some brush-wood grows around the cove, but it is too small to be useful. In proceeding through the gut of West Point from the southward, with ebb-tide, which runs to the N. E. with great rapidity, the great harbour, when opened, must be hastily entered, in order to avoid being swept to the northward by the stream.

From the south entrance of West Point harbour, NEW ISLAND lies S. 25° W., 22 miles distant. Its western side presents a range of frightful precipices, one of which is 550 feet above the sea, which, in westerly storms, beats against its base with extraordinary violence. The eastern side, on the contrary, falls sloping into points, forming bays; and of these *Ship Harbour* is the third from the south: this being the preferable anchorage, is the most to be recommended. In proceeding to it with a strong westerly wind, on rounding the north end of New island, the sail on the ship should be particularly attended to, as the gusts of wind off the high land blow with great violence, With the wind at S. W. the south passage may be chosen; but it is to be noticed, that a cluster, called the *Seal Rocks*, lie off the south end of the island, between which and the rocks is the best passage; and by keeping without the edge, off the kelp, which extends to a short distance from the end of the island, there is no danger. The small round isles, on the eastern side of New island, have good channels within, and between them Ship harbour may be easily recognised, by its having a small isle, *Ship island*, on it. Behind this is the best anchorage, in 7 fathoms, in a bottom of stiff clay, with the south point of Ship island bearing S. E., covering the S. E. point of the bay. The anchorage is perfectly land-locked. Good water may be obtained at a sandy beach, abreast of the anchorage, but it should be taken at 8 or 10 yards higher than the present pool on the bank, otherwise it may be brackish and undrinkable.

In sailing from the westward, in latitude 51° 42′ S., New island may be readily distinguished, by its being the most northerly large island of that cluster, and by two islets lying off its north end, called Saddle isle and North head: between these and the north end of New island is a clear passage, but in which, during strong winds, the tide ripples violently.

PORT EDGAR. In 1830, H. M. S. Eden, commanded by Captain W. F. W. Owen, was forced into Port Edgar, by stress of weather, when on her way from Cape Horn to Rio Janeiro, in the month of March. Captain Owen describes it as "a beautiful port, having many advantages for a settlement, with abundance of water, peat, good soil, and stock. The depth of water, in the middle of the entrance, is 18 fathoms; and the general depth in the port, between the two points, Leven and Eden, is 210 fathoms across, but 150 only clear of the weed off each point, and there is a depth of 4 fathoms alongside these points. No current of tide was observed during the last three days of the moon's first quarter, and a rise and fall of only 3 feet."

Captain Owen further observes, "that a convenient port is much wanted on the southern coast of the West Falkland island; for ships are frequently caught in furious southern gales, in rounding the Horn, and sometimes suffer much injury. Such a port as that of Edgar would not only afford such shelter, but is convenient to start from, with the first of a North or N. W. wind, which would carry them clear round. It would answer much better as a private speculation, in the hands of an independent company, and being a free port, than as a public concern." There is no timber to be seen, but Captain Owen is of opinion, that English woods would grow in the sheltered valleys, and on the northern and eastern slopes of the hills.

The *Eden* was overtaken by a furious gale, between Beauchene and Porpoise point, with thick snow and hail-storms, when, not being able to weather Beauchene, nor to see around, Captain Owen was obliged to seek a port. Two days afterwards, the *Durance*, a French frigate store-ship, was placed in similar circumstance, and just weathered Beauchene. (*Nautical Magazine for* 1832, *page* 397.)

SOUTH GEORGIA.

In 1675, South Georgia was discovered by Antony La Roche, and in 1775 was explored by Captain Cook, from whose description the following is taken. "At 9 *a. m.* (January 14th) saw an island of ice, as we then thought, but at noon were doubtful whether it was ice or land. At this time it bore E. ¾ S., distant 13 leagues. Our latitude was 53° 56′ 30″ S., longitude 39° 24′ W. Several penguins, small divers, a snow petrel, and a vast number of blue petrels about the ship. We had but little wind all the morning, and at two *p. m.* it fell calm. It was now no longer doubted that it was land, and not ice, which we had in sight. At four in the morning of the 16th, wore and stood to the east, with the wind at S. S. E., a moderate breeze and fair; at eight o'clock, saw the land extending from E. by N. to N. E. by N. At noon, observed in latitude 54° 25′ 30″ S., longitude 38° 18′ W. In this situation we had 110 fathoms of water, and the land extending N. ½ W. to East, 8 leagues distant. The northern extremity was the same that we first discovered, and it proved to be an island, which obtained the name of Willis's Island, after the person who first saw it. It is a high rock, of no great extent, near to which are some rocky islets. Willis's island is situated in latitude 54° S. longitude 38° 23′ W.

"As we advanced to the north, we perceived another isle lying east of Willis's, and between it and the main. This we called Bird Isle, on account of the vast number that were upon it. It is not so high, but of greater extent, and is close to the N. E. point of the main land, which we named Cape North The S. E. coast of this land, as far as we saw, lies in the direction of S. 50° E., and N. 50° W. It seemed to form several bays or inlets, and we observed large masses of snow or ice in the bottoms of them, especially in one which lies two miles to the S. S. E. of Bird isle. Seeing there was a clear passage between this isle and Willis's, we steered for it; and, at five o'clock, being in the middle of it, we found it about two miles broad. After getting through the passage, we found the north coast trended E. by N. for about nine miles, and then east and east-southerly to Cape Buller, which is eleven miles more. We ranged the coast at one league distance, till near ten o'clock, when we brought-to for the night, and on sounding, found 50 fathoms, muddy bottom."

Captain Cook proceeded to examine the eastern coast, and took formal possession of the land. The tide seemed to rise about four or five feet. High water at about 11 *h.*, full and change. The head of Possession bay, as well as two places on each side, was terminated by perpendicular ice-cliffs, of considerable height. Pieces were continually breaking off, with a loud explosion, and floating out to sea. "The inner parts of the country were not less savage and horrible. The only vegetation we met with was a coarse strong-bladed grass, growing in tufts, wild burnet, and a plant like moss, which sprang from the rocks. Seals were numerous; several flocks of large penguins were seen. The oceanic birds were albatrosses, common gulls, terns, shags, divers, &c. The land-birds were a few small larks. No quadruped was seen."

At the S. E. end of Georgia is COOPER'S ISLE, a rock of considerable height, about five miles in circuit, and one mile from the main. At this isle the main coast takes a S. W. direction, for the space of four or five leagues, to the point named Cape Disappointment. Off that are three small isles, the southernmost of which is green, low, and flat, and lies one league from the cape.

"The island seems to abound with bays and harbours, the N. E. coast especially; but the vast quantity of ice must render them inaccessible in the greatest part of the year, or, at least, it must be dangerous lying in them, on account of the breaking up of the ice-cliffs. It is remarkable that we did not see a river, or stream of fresh water, on the whole coast. I think it highly probable that there are no perennial springs in the country; and that the interior parts, as being much elevated, never enjoy heat enough to melt the snow, in such quantities as to produce a river or stream of water. *Clerk's Rocks* are three or four rocky islets, which were subsequently seen at the distance of two or three miles; vast numbers of birds, especially shags, were about them."

SOUTH GEORGIA was visited by Captain Weddell, on his return from the southward, in March, 1823. On the 12th, at 3 *p. m.*, the *Jane* and *Beaufoy* anchored in Adventure bay, on the S. W. side of the island, in 7 fathoms, bottom of strong clay. The following is Captain Weddell's description:— "The island is about 96 miles long, and its mean breadth about 10. It is so indented with bays, that in several places, where they are on opposite sides, they are so deep as to make the distance from the one side to the other very small. Near the west end, in particular, there is a neck of this kind, about half a mile broad, over which boats are frequently transported. The tops of the mountains are lofty, and perpetually covered with snow; but in the valleys, during the summer season, vegetation is rather abundant. Almost the only natural production of the soil is a strong-bladed grass, as above-mentioned, the length of which is, in general, about two feet; it grows in tufts, on mounds 3 or 4 feet from the ground. No land-quadrupeds are found here; birds and amphibious animals are the only inhabitants: of the bird tribe, the king-penguin is the most worthy of notice."

THE SANDWICH LAND.

THIS land was first discovered in 1775, by Captain Cook, on proceeding to the south-eastward from South Georgia. From the latitude of 59° 30′ S., longitude 29° 24′ W., the ship stood to the N. E. over a sea strewed with ice. "At half an hour past six next morning, as we were standing N.N.E., with the wind at West, the fog very fortunately clearing away a little, we discovered land ahead, 3 or 4 miles distant. The weather then cleared up a little more, and gave us a tolerable good sight of the land. That which we had fallen in with proved to be three rocky islets, of considerable height.

The outermost terminated in a lofty peak, like a sugar-loaf, and obtained the name of Freezeland peak. Behind this peak, that is to the east of it, appeared an elevated coast, whose lofty snow-clad summits were seen above the clouds, It extended from N. by E. to E. S. E.,, and I called it Cape Bristol, in honour of the noble family of Hervey. At the same time another elevated coast appeared in sight, bearing S. W. by S., and at noon it extended from S. E. to S. S. W., from 4 to 8 leagues distant; at this time the observed latitude was 59° 13′ 30″ S., longitude 27° 45′ W. I called this land Southern Thule′, because it is the most southern land that has yet been discovered.

"It shows a surface of vast height, and is everywhere covered with snow. Some thought they saw land in the space between Thulé and Cape Bristol. It is more than probable that these two lands are connected, and that this space is a deep bay, which I called Forster's bay. At one o'clock, finding that we could not weather Thulé, we tacked and stood to the north; and, at four, Freezeland peak bore East, distant 3 or 4 leagues. Soon after, it fell little wind, and we were left to the mercy of a great westerly swell, which set right upon the shore. We sounded, but a line of 200 fathoms found no bottom. At eight o'clock, the weather, which had been very hazy, clearing up, we saw Cape Bristol, bearing E. S. E., and terminating in a point to the north, beyond which we could see no land. This discovery relieved us from the fear of being carried by the swell on the most horrible coast in the world, and we continued to stand to the north."

On the 2nd of February, the *Candlemas Isles* were seen. They appeared to be of no great extent, but of considerable height, and covered with snow. A small rock was seen between them, and perhaps there may be more, for the weather was so hazy that the sight of them was soon lost.* In closing his remarks on these lands, Captain Cook observes, "I concluded that what we had seen, which I named Sandwich Land, was either a groupe of islands, or else a point of the continent. For I firmly believe that there is a tract of land near the pole, which is of most of the ice that is spread over this vast southern ocean. I also think it probable, that it extends farthest to the north, opposite the Southern Atlantic and Indian Oceans; because ice was always found by us further to the north in these oceans than anywhere else, which I judge could not be, if there were not land to the south,—I mean land of considerable extent."

The brig *Tula*, of 148 tons, belonging to Messrs. Enderby, and commanded by Mr. John Biscoe, R. N., left the port of London on the 14th July, 1830, on a South-Sea sealing voyage, but with special instructions from her owners, also to endeavour to make discoveries in a high southern latitude. She was liberally equipped with whatever appeared requisite or desirable on such an enterprise, and was accompanied by the cutter *Lively*, in the same employ, and attached to the Tula on the footing of a tender.

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* *Captain Morrell, in the schooner Wasp, on his voyage from the eastward, 28th February*, 1823, says, "The cheering cry of 'Land ho!' resounded from aloft. This proved to be the Candlemas Isles, the most northerly isles of Sandwich Land, latitude 57° 10′ S., longitude 26° 59′ W. These two islands are of no great extent, but one of them is of considerable height; both are burning volcanoes, and the most western is burnt down nearly to a level with the sea. We continued examining these islands towards the south, until we arrived at the Southern Thule′, where, on the N. E. side of the westernmost island, we found a good harbour. In this groupe, we saw nine burning volcanoes;—fire in abundance, but no fuel for the *Wasp*. Three of these islands had vomited out so much of their contents, that their parts which have not been consumed by internal fires are very high, and covered with perpetual snows; the rest is broken land. The westernmost point of Southern Thule′ is in latitude 59° 35′ 10″ S., and longitude 27° 42′ 30″ W."

Extracts from Captain Biscoe's Journal. "The two vessels, after touching at the Cape Verd islands, for salt. arrived off the Falkland islands on the 8th November, and anchored in Port Louis, Berkeley Sound, on the 10th. Captain Biscoe speaks highly of the convenience of this port, for vessels round Cape Horn. Fish, bullocks, and fresh water can be easily procured, with a variety of antiscorbutic herbs, to use as vegetables,—the entrance being also clear, the anchorage good, and the depth of water considerable, close to the beach. On the 27th November, having completed their water, the Tula and her consort again proceeded to sea, and, on their way to Sandwich Land, kept a vigilent look-out for the Aurora islands, (before noticed in page 209.) On the 10th December, in longitude 29° 14′ W., many icebergs were passed, which were conceived to be drifting between Sandwich Land and New South Shetland; and among them the two vessels parted company, to their mutual great anxiety, and did not meet again till the 14th. On the 20th, an island was made, in latitude 58° 25′ S., longitude 26° 55′ W.; but its appearance being very discouraging,—in Captain Biscoe's words—'terrific, being nothing more than a complete rock, covered with ice, snow, and heavy clouds, so that it was difficult to distinguish one from the other,'—no attempt was then made to land on it. Proceeding to the southward, on the following day, another island was distinguished in the S. W., similar to the preceding one, which now bore W. by N., and the cutter was directed to examine both, in which her success was very incomplete, the boats not being able to effect a landing on either. These were the *Montague* and *Bristol islands* of the charts, but which Captain Biscoe places 50 miles further west than they are usually laid down. The thermometer stood at 29° in the air, and 31° in the water. A third, Friesland island, was seen to the southward of them, and a fourth to the northward.

"Several following days were spent in endeavouring to get to the southward, and, if possible, also to the westward, there being strong indications of land in that quarter; but these were all unsuccessful. The field-ice was either quite continuous and unbroken, or, where bays were formed in it, and entered, these were found open but a little way, and the vessels were obliged to return as they went in. Fortunately, the water was remarkably smooth, even when the wind, which hung to the westward, blew strong; and this circumstance both facilitated the manœuvring of the vessels, and encouraged their crews to persevere, by confirming their surmises as to the existence of land in the neighbourhood. On the 29th, at noon, the latitude observed was 59° 11′ S., longitude 24° 22′ W., but the wind blowing then hard from the S. W., further investigation in that quarter was abandoned. The islands before seen were again sighted, and the longitudes of their centres being further determined, and confirmed to be about 27° W., sail was made to the eastward.

On the 5th January, 1831, the Tula and her companion were in latitude 59° 9′ S., longitude 21° 52′ W.; and on the 7th, in latitude 59° 35′ S., longitude 20° 21′ W., closely skirting the field-ice the whole way, and examining every inlet, in hopes of finding a passage through it to the southward, and, as they hoped, to clear water. In this, however, they were constantly disappointed; and, on the contrary, on the evening of the 7th, says Captain Biscoe, 'my hopes in this direction were destroyed, for I suddenly found myself at the head of a bay of firm ice, with a view, from the mast-head, to an extent of at least 20 miles in every direction; and to the southward, the ice appeared so smooth and firm, that any one might have walked on it. The weather, too, was now so clear, that I am convinced, land of any considerable elevation might have been seen 80 or

90 miles. What further astonished me was, that there were no living animals of any kind about this ice, with the exception of one or two small petrels, not even penguins, which at other times had been very numerous. These circumstances almost convinced me that this ice must have been formed at sea,—the temperature of the water being then 30°, and that of the air 31°, with frequent and very heavy falls of snow. Nevertheless, there were strong indications of land in the S. W., though none was actually within our horizon, and the water continued very smooth." *Journal of the Royal Geographical Society. Vol.* 3, *page* 105.

SOUTH SHETLAND.

Mr. William Smith, commander of the brig Williams, of Blyth, was the first that saw this land, in the month of February, 1819. On the 19th, land or ice was seen in latitude 62° 40′ S., and near the longitude 62° W., then bearing S. E. by S. about two leagues. The Williams was at this time on a voyage from Buenos-Ayres to Valparaiso, and stretching far to the south. A combination of adverse circumstances, such as hard gales, with flying showers of snow, and fields of ice, prevented at this time the exploration of the coast; but on a subsequent voyage, from Monte-Video to Valparaiso, in October of the same year, the Williams again made the land. Captain Smith says, "I, to my great satisfaction, discovered land on the 15th of October, at six *p. m.*, in latitude 62° 30′ S., and longitude 60° W., by chronometer, bearing distance about three leagues, hazy weather; bore up and sailed toward it; at four miles distant, sounded in 40 fathoms, fine black sand;—an island bearing E. by S. At S. E. by E. bearing, sounded in 60 fathoms, same bottom; hauled off during the night to the northward; at daylight stood in for the land again, at three leagues distance. From the body of the islands sounded again, 95 fathoms, fine sand and ooze; at eight, weather clear and pleasant, saw the main-land bearing S. S. E., distance from the islands about three leagues. Having ran as far as the Cape, we found the land trend off to the N. E. Coasting to the eastward, and sounding, found it similar to the former, fine sand. A point bearing E. ½ S.—hauled in for it; got the island to bear N. W., distance half a league; soundings regular from 20 to 35 fathoms, good bottom, sand and gravel. Finding the weather favourable, we down boat, and succeeded in landing; found it barren, and covered with snow. Seals in abundance.

"The boat having returned, which, when secured, made sail off shore for the ensuing night. In the morning altered the course, so as to keep the land to the southward in view. Having doubled the point above-mentioned, the land then took a south-easterly direction, varying to the eastward; weather thick and squally, with snow. I thought proper, having property on board, and perhaps deviating from the assurance, to haul off to the westward on my intended voyage. Strong variable winds. Made another cape, and could perceive some high land to the westward of it, and stretching in a S. W. direction. The weather becoming thick and squally, we made sail to the westward, having sailed 150 miles to W. S. W. The weather moderating, saw another head-land, bearing, by observation, E. N. E., distance 10 leagues, very high; observed in latitude 62° 53′ S., and longitude, by chronometer, 63° 40′ W. of Greenwich; named this Smith's cape. Found the land to extend from the cape in a southerly direction. Shaped my course for Valparaiso, where I arrived on the 24th November, after a passage of 60 days from Monte Video."

They have been frequently visited since that time, for the purpose of taking fur-seals and sea-elephants, with which the shores abound. They extend from E. N. E. to S. S. W., over a space of nearly 300 miles, and consist of twelve islands of moderate extent, and a great number of rocks and cliffs. The largest of the islands, from east to west, are Clarence, Elephant, King George, Strachan, Mitchel, Sartorius, Livingston, Low, and Smith. The interior of these islands consists of high hills or mountains. A mountain on Smith's island attains the height of 6,600 feet above the sea. They are almost entirely covered with snow all the year round, and only after midsummer (in January) a few tracts, which are free from snow, are overgrown with liches and mosses, in some places intercepted with a sort of straggling grass. The only inhabitants of these cold regions are numerous sea-fowls, as the albatross, penguin, &c., and the animals abovementioned. The surrounding sea abounds in whales and fish. Most, if not all, of these islands are of volcanic origin. Captain Weddell observed smoke issuing from the rocks of Bridgman island; and the island of Deception has the form of a horse-shoe, resembling in that respect the islands of the Pacific, which are formed by madrepores. The deep impression in the middle of Deception island, which is 97 fathoms deep, and makes an excellent harbour, (Port Foster) is doubtless a crater; and this island may, as to form, be compared with the island of Nisita, in the Bay of Naples. The high rocks which enclose this crater are volcanic, rise to more than 800 feet above the sea, and are partly covered with ice. South of these islands is a wide strait, called Bransfield strait. The coasts which constitute the southern shores of this strait appear to form an extensive country, which has lately attracted the attention of navigators, and rekindled the spirit of enterprise in Great Britain and other countries. In 1821, Powell discovered Trinity Land, south of the South Shetlands and the South Orkneys, between 60° 30′ and 61° S. latitude, and 44° 30′ and 46° 30′ W. longitude. Palmer, an American, discovered a coast-line west of Trinity Land, which is called Palmer's Land; and the Russian navigator, Bellingshausen, discovered Alexander's Land, S. W. of Palmer's Land. All these lands are south and west of the South Shetland islands. In 1823, Weddell tried to find land east of the meridian of these islands. He did not find land, but he succeeded in advancing as far as 74° 15′ S. latitude, where he found a sea clear of ice.

On the 12th February, 1832, Captain Biscoe, in the Tula, was coming from the westward, in latitude 66° 27′ S., longitude 81° 50′ W., many birds were seen, (albatrosses, penguins, cape-pigeons, &c.) with several humped and finned-back whales; and no fewer than two hundred and fifty ice-islands were counted from the deck. On the 15th, land was seen, bearing E. S. E., but at a great distance, the latitude being then 67° 1′ S., longitude 71° 48′ W., and sail was made to close it. On the following morning it was ascertained to be an island, and called Adelaide island, in honour of her Majesty; and, in the course of the ensuing fortnight, it was further made out to be the westernmost of a chain of islands, lying E. N. E. and W. S. W., and fronting a high continuous land, since called Graham's Land, which Captain Biscoe believes to be of great extent. The range of islands has been also since called Biscoe's range.*

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* It is probable that the coast which Biscoe saw was that which had been seen in 1599, by Dirk Gerritz, a Dutchman. His vessel, which belonged to a Dutch fleet, commanded by James Mahu, on leaving the Straits of Magalhaens for the Pacific, had been separated from the other vessels, and carried by winds and currents as far south as 64°, where he found a lofty coast, which Gerritz compared with that of Norway. He was unable, however, to determine the position of this newly-discovered coast.

"Adelaide Island has a most imposing and beautiful appearance, with one high peak shooting up into the clouds, and occasionally appearing both above and below them; and a lower range of mountain, extending about four miles from north to south, having only a thin covering of snow on their summits, but towards their base, buried in a field of snow and ice of the most dazzling brightness, which slopes down to the water, and terminates in a cliff of 10 or 12 feet high, riven and splintered in every direction, to an extent of two or three hundred yards from its edge. At a distance of three miles, no bottom could be found with 250 fathoms of line, and round all the islands the depth of water was considerable. One, called Pitt's island, in latitude 66° 20′ S., longitude 66° 38′ W., has many bays, and forms, with the main land behind, a good harbour for shelter, but the bottom is rocky. No living animal was found on any of these islands, and not many birds, although only a few miles to the northward they were very numerous."

"On the 21st February, Captain Biscoe succeeded in landing on what he calls the main land, and took formal possession of it,—the highest mountain in view being called Mount William, after his Majesty, and the next Mount Moberly, in honour of Captain Moberly, R. N. The place was in a deep bay, 'in which the water was so still, that could any seals have been found, the vessels could have been easily loaded, as they might have been laid alongside the rocks for the purpose. The depth of water was also considerable, no bottom being found with 20 fathoms of line almost close to the beach; and the sun was so warm, that the snow was melted off all the rocks along the water-line, which made it more extraordinary that they should be so utterly deserted. The latitude of Mount William was determined to be 64° 45′ S., longitude 63° 51′ W. Captain Biscoe, after this, repaired to the South Shetland islands, where he was driven ashore, lost his rudder, and very narrowly escaped shipwreck." *Journal of the Royal Geographical Society of London. Vol.* 3, *page* 110.

General Remarks. All the northern part of the coasts of South Shetland abounds with islets, rocks, and breakers, while the southern coasts are entirely clear of these dangers; but in the early part of the spring, the southern sides are blocked with ice, which comes from the land to the south of, and opposite to it. When you come up as far as the south beaches, you again meet with rocks and breakers.

The best harbour is formed by Deception Island, which island, or *shell* of an island, is certainly one of the most singular productions of nature. The land is high, and bold on every side, with a narrow opening, of about a cable's length, on its S. E. side, leading to a very capacious basin. The isle is a volcanic production; its shores on either side are bold, and pumice-stone, with other substances, indicate its origin. There are also several hot springs, some of which are of a temperature sufficient to boil an egg. The basin is 5 or 6 miles across. At its mouth you will have 3, 4, and 7 fathoms of water, and increase very rapidly as you enter; from 7 fathoms you increase to 10, then 18, 27, 32; and then, a little within this, you will get no bottom at 60 fathoms. On the N. W. side of the basin there is a very fine cove, capable of containing several vessels, in about 4 or 5 fathoms of water, and a bottom of good clay. From the entrance of the basin up to the cove the course is N. W. by W.

Bridgman's Island. Near the centre of the Shetland group is Bridgman's island, in latitude 62° 4′ S., longitude 57° 0′ W., apparently another volcanic production. The figure of the island is nearly round; it is very small, but 400 feet in height, partaking of the form of a sugar-loaf. Captain Weddell, on passing within 200 yards of it, observed smoke issuing through the fisures of the rock, and apparently with much force.

TIDES. On the north coast of South Shetland the tides are very irregular, being sometimes high water for 24 hours together; at others, it flows tide and half-tide, and remains for about 3 or 4 hours high water, and then ebbs again, though there is, in general, one flood and one ebb every 24 hours. Gales of wind raise the tide sometimes much above its natural level, which may account, in some measure, for many skeletons of whales which lie in many places 12 or 14 feet, at least, above high water mark, and many yards from the sea-shore. In Blythe bay (Desolation island) an easterly gale will raise the water considerably above its common height; and the brig *Lady Troubridge*, of Liverpool, that drove on shore on Christmas-day, 1820, was found, in the next season, forced up nearly high and dry. Near the mouths of the straits the tides run very strong, and in various directions, which renders the navigation, in light winds, both unpleasant and unsafe. The flood-tide on the coast sets to the eastward.

In a S. W. gale, the tide runs directly to windward, a full league from the coast, at the rate of two or three knots; and, *vice versa*, to the eastward again, when the brig Williams, and the ship Indian were at once blown out of Blythe bay, with a gale of wind from the eastward. The Indian drove 10 leagues to the westward, and the Williams, though lying-to, drove up 7 leagues to the eastward, and dead to windward two-thirds of the way, which evidently shewed, that the two vessels had received the impulse of two contrary streams.

From the observations which have been made, it is conjectured that the flood and ebb, in moderate weather, runs backward and forward in the offing, as far as two leagues from the outer points of the land, taking the sweep of the bays; but, be it understood, that it sometimes runs much longer both ways, and likewise stronger than it does at others. Its distance from the coast also varies outside these limits; the current has been found to run, at least a knot, in the same direction as the wind blows.

From the above remarks, it clearly shows, that it is not easy to give any satisfactory account of the tides, so as to reduce them to any thing like a regular theory. One circumstance, however, may be worthy of notice; fragments of the wrecks of the *Cora* and *Clothier* were all invariably drifted to the westward. Cape Shirreff and the north beaches were scattered all over with them, and not one single particle was ever found to the eastward. The Cora's were easily identified, being either cedar or mahogany. On the south side of the land, it is pretty generally admitted, that the motion of the water is, on the contrary, toward the *eastward*, and carrying with it vast quantities of ice, in the direction of the coast, toward Sandwich Land.

WINDS. "Nearly all the misfortunes that have happened in South Shetland have been in gales of wind from the eastward, which frequently prevail here, and blow with tremendous fury, generally accompanied with heavy falls of snow. No less than seven vessels have been lost, and all with easterly gales, excepting the Clothier, an American, which struck on a sunken rock. In the years 1820, 21, and 22, four-fifths of the gales were from the eastward,—though we had all looked for harbours sheltered from the westward, under the impression that we should have most to fear from that quarter.

"In fine weather, the winds from the S. W. and N. E. are about equal, not keeping long in either quarter. Indeed, with very few exceptions, the winds are always along the land, which renders this coast far less dangerous, when under sail, than it would otherwise be. The south-westers here, much like the north-westers at home, are attended with a fine clear sky, and generally sweep away all the fog and sleet of the light north-westers.

In two seasons, I recollect only one gale from the N. W., which was very heavy. I was then in Blythe bay, and it was perfectly smooth, though the sea outside was, in a manner, overwhelming.

"It would appear, if a parallel may be drawn from these two seasons, that gales of wind on the land are very unfrequent. I have noticed that the wind on the land is generally light, with thick dirty weather; however, the gales of wind, after the middle of February, begin to increase in strength, and it is then not worth any one's while to stop longer on the coast. Were I bound round Cape Horn, and to meet with adverse winds, I would not keep hugging the wind, and going about with every slant, but check the topsail yards in, and keep my reach to the southward, when I should be sure to be not long without an easterly wind, with which I could soon get sufficient westing, (the degrees of longitude being so short) and such an offing from the western part of Terra del Fuego, as to make for me a S. W. wind a fair one. The danger of falling in with ice is almost chimerical, there being no low drift ice on the north side of Shetland; and in two seasons, I only saw three ice islands." *Captain Robert Fildes, of Liverpool.*

On approaching South Shetland from the Northward, Livingston's, or the main island, will appear in mountains of a vast height, and covered entirely with snow, the base of them terminating in perpendicular ice-cliffs. On this side of the group, in latitude 62° 20′ S., and longitude 59° 45′ W., is a small isle, named *Table island*, which is by far the most remarkable hereabout, and will always be an infallible mark for any one approaching, as it is not possible to mistake it for any other land. All strangers, therefore, should make this their landfall, particularly in the early part of the season, for then the land is not so easily made out, it having a great quantity of snow upon it, which may at times deceive those best acquainted. Its top appears as level as a bowling-green, and its sides resemble a wall. In the upper part of the N. E. end of it is a chink or division, which from some situations may be seen.

SECTION VIII.

COAST OF BRAZIL.

GENERAL DIRECTIONS. It is usual for ships bound from England to South America, or Brazil, to shape their course so as to give Cape Finisterre a berth of about 40 leagues, and, passing the Coast of Portugal, steer toward the island of Porto Santo, or Madeira, making a large allowance for the current setting eastward, toward the Strait of Gibraltar, and south-eastward, toward the shore of Morocco, and still more southerly, toward the coast eastward of the Canary islands.

After passing to the westward of Madeira, the track most advisable is to the westward of the Canary and Cape Verd islands, at any discretional distance, or barely in sight of them. By adopting this course, you will not only avoid the light winds and calms, which frequently prevail among these islands, as well as several dangers in their vicinity, but may reasonably expect a steadier breeze; although there are instances of ships, after passing in sight of the Canaries to the westward, having the wind from that quarter, which obliged them to pass to the eastward of the Cape Verd islands.

During the winter months, those who are not desirous of stopping in Funchal road, should endeavour to pass to the westward of Madeira; also, at any convenient distance, exceeding 6 or 7 leagues, because strong westerly gales prevail in November, December, and January, which produce severe squalls and eddy winds, near the island, on the east side.

Having passed to the westward of the Canary and Cape Verd islands, steer on southerly, and endeavour to cross the line in and from 20° to 23° W. longitude, but by no means further to the westward, lest the westerly current, which sweeps round Cape St. Roque, should lead you into danger; and in approaching the coast of Brazil, considerable attention should be paid to the season of the year, periodical winds prevailing from S. S. E. and S. E., from March to September,—the current then runs northerly; but from September to March, the wind blows from the N. E. to E. N. E.,—the current sets to the northward. Mariners, therefore, should endeavour to make the land to the windward of the port they intend to touch at; and, according to these periodical winds, which commonly govern the current, when the sun is in the northern hemisphere, the winds on the Brazil coast will incline more from the south-eastward, than in the opposite season, when the sun is to the southward of the equator, for then they prevail to the eastward. It also appears, that in any season of the year, if the coast be not made to the northward of Cape St. Augustine, there will be no difficulty in getting on to the southward; for ships which have made the land in latitude 7° and 8°, even in the unfavourable season, by making a few tacks, always readily proceeded to the southward, and experienced little or no northerly current; nevertheless, in a bad sailing ship, it would be highly imprudent to make it to the northward of Cape St. Augustine, especially between the months of March and October, and certainly it should never be made to the northward of Cape Ledo, or near Cape St. Roque, on account of the S. E. winds, and W. N. W. currents, before-mentioned, which might fatally sweep you round to the northward of the cape.

Every navigator should, therefore, be attentive to the time of the year he makes the Brazil coast, there being a kind of monsoon or trade-wind blowing from the N. E. and E. N. E., with a current setting south, from the month of September to March; while, from March to August, the winds are from the S. E., E. S. E., and S. S. E., the current then setting north: according, therefore, to these seasons, he should run into a higher or lower latitude than the port he is bound to. From Cape St. Roque to Cape St. Augustine, the land may be approached by soundings, of moderate depth, and gradually lessening as you approach the shore. A strong southerly current commences from Cape St. Augustine, about the middle of October, and continues until January. No particular current succeeds till the month of April, when, generally about the middle of that month, a strong one sets in northerly until July, when it again subsides until October; and near the shore, the wind, for nine months in the year, generally blows north-easterly in the morning, and north-westerly during the night, continuing, gradually changing along the coast, until, at Rio Janeiro and the Rio de la Plata, it becomes a regular land-breeze from evening to morning, and throughout the day the reverse. From the end of February till the month of May, the wind is mostly from the south, blowing strong and stormy, with frequent squalls from the S. W.

THE NORTHERN COAST. Cape St. Roque is a head-land, lying in latitude 5° 28′ 17″ S., and in longitude 35° 17′ W., 27 miles to the S. S. E. of Point Toiro, or Calcanhar, the N. E. point of Brazil. Northward of Cape St. Roque, the coast gradually falls, or declines in height, to the distance of 8 miles, when it forms the low point Petetinga; here the shore on the north forms a low bay. The point is not more remarkable than Cape St. Roque, and is to be ascertained at a distance, by the difference of latitude only. The extremity of Point Petetinga is given by Baron Roussin in latitude 5° 21′ 35″ S., and longitude 35° 19′ 23″ W. *Point Toiro, or Calcanhar*, in latitude 5° 8′ 20″ S., and longitude 35° 30′ 33″ W., is situate at the distance of 6 leagues, N. N. W. ½ W. (N. W. by N.) from Point Petetinga. From Cape St. Roque to Point Toiro, the shore is bordered by the Recife, or that remarkable ridge of coral rock, which characterises the coast in general. The more elevated part of this reef, within the present extent, is called *Pedras de Garca*, about 8 miles to the northward of Point Petetinga, and near which there is good anchorage.

Banks of St. Roque. These banks commence at Cape St. Roque, in the south, and terminate beyond Point Tuberao, or Tuberon, in the N. W., an extent of 34 leagues. The northern edge lies in latitude 4° 51′ S.; the longitude of the N. E. part is 35° 25′ W., and of the western part 36° 30′ W. Between the shore and the banks there is a channel, which is known and used by the coasters; there are also passages between the dangerous spots on the banks, but they should never be attempted by strangers. The shallowest parts of the bank are distinguished generally by breakers; of these the easternmost is a little to the west, distant about 4 leagues from Point Toiro, but its breakers are seldom seen. The second lies to the west, off a point called Tres Irmaos, or the Three Brothers; this is called *Lavandeira*, and occupies a great extent from east to west. The third, or westernmost, is a group of rocks, called the *Urcas*, in longitude 36° 18′ W. The breakers on the Lavandeira and Urcas are very heavy at all times, but particularly when the wind blows from the offing towards shore. The Bank or Paracel of St. Roque, with 6 or 7 fathoms, terminates at about 6 leagues west from the Urcas. On approaching to the edge of the bank, soundings of light sand will be found, with an admixture of broken coral, and a sudden discolouration of the water from a blue to a green colour. Hereabout the tide rises from 6 to 8 feet. From the outer edge of the bank, the coast, although low, may generally be seen, in clear weather, at from 10 to 12 miles off.

Beyond Point Toiro the coast, extending W. N. W., is generally low, having few distinguishing objects. To the south-eastward of Ciara there are, however, many inland hills, and the coast is bordered with a remarkable ridge or reef of coral rocks. This reef, with frequent breaks, continues along shore 19 leagues to the north-westward of Ciara; and within this extent the land is moderately high, but it declines thence westward, and presents a low shore, with sand-downs, some of which are very little above the surface of the sea. The soundings are mostly regular, and decrease gradually toward the shore, from a distance of 4 or 5 leagues.

Point do Mel, in latitude 4° 55′ S., and longitude 36° 59′ W., is a broad headland, bordered with the recife, and dividing two spacious bays on the east and west. The extreme points of these are Point Tuberao, at 10 leagues to the E. S. E., and the Morro Tibao, or Little Reteiro, at 6 leagues to the W. N. W. The bank of soundings here extends to 4 or 5 leagues from shore.

Angerstein Reef. In the month of December, 1830, the brig Angerstein, John Bouch, master, passed through a cluster of rocks, thirteen in number, and from 2 to 3 fathoms under water. The vessel ran close alongside of one, which was quite visible under the water, and the master, heaving the lead on it, had not more than 11 feet of water. Mr. Bouch describes the rocks as of a dark brown colour, showing themselves sufficiently for a vessel to pass clear of them; and before a second cast can be got, you may be in 10 fathoms of water. "They lie in a triangular form, about 11 miles from the land, with Point do Mel S. S. E. ½ E., and the Red

Mount on the Reteiro W. N. W. ½ W., about 8 leagues,; with the given bearings and distance from land, the latitude must be 4° 44′, or 4° 45′ S., and longitude 37° 6′ W. Like the Urcas, at 15 leagues to the eastward of them, they seem to lie on the edge of the flats, where there is a depth of 6 fathoms, corally ground."

ARACATI. The first port of the Northern Coast of Brazil is that of Aracati, on the river Jaguaripe, a place of rising consequence. The mouth of the river is in latitude 4° 23′ 30″ S., and longitude 37° 49′ W. At the entrance is a narrow and dangerous bar, owing to sand-banks on each, and upon these the surf is very violent. The sand is so loose at the mouth of the river, that, even with the coasting-vessels of the country, every precaution is required. Within the bar the river widens immediately, and forms rather a spacious basin.

Mr. Richard Dixon, commander of the Westmoreland, of Liverpool, says, "As vessels frequently engage at Pernambuco, on the eastern coast, to load a cargo, or part of a cargo, at Aracati, they consequently proceed, in the first instance, to the N. N. E., and then N., until they have passed Cape St. Roque, and the parallel of the extensive flats on the north coast, bearing the same name. The latitude of the Urcas, the most dangerous reef on these flats, is 4° 50′ S., in the longitude of 36° 18′, or thereabout. On approaching near enough to the shore, Point do Mel will be seen, composed of red cliffs, and low white spots of sand on each side of them. This point must be avoided, for when it bore about S. S. E., at the distance of seven miles, we were on a shallow bank of 17 feet, and further to the leeward the water appeared white, and, without doubt, was shallower. Running along shore north-westward, and keeping in about 6 fathoms, Point Reteiro Pequeno, formerly called Cape Corso, will be seen, and also a mountain, appearing blue in the interior; the former appears red, being a large bank of red sand, and the latter resembles Bardsey island, in the St. George's Channel. When these two objects are in one, the Reteiro Grande, or Algeberana head, will be distinctly seen. The land to the south-eastward of this head, for 3 or 4 miles, has a very singular appearance, forming like two steps, the lower part being reddish, and the other grey. The head itself is rugged, and has a pinnacle close to its base, which, when bearing W. by S., will appear open.

"At the distance of about a mile there are several rocks, of which the outermost is covered at high-water; it is necessary, therefore, to give this head a good berth, until a large lump, or hill, situated on the S. W. side of Reteiro bay is brought to bear S. W.; then steer toward the hill, until Reteiro head bears E. S. E. With these bearings there is safe anchorage in 3 fathoms of water; or if the vessel's draught will admit, you may go farther in and, have smoother water, as the rocks off the head break off much of the sea. The distance from this place to Aracati is about 21 miles, and a great part of the way is along the sea-shore. The course from this anchorage to the bar of Jaguaripe is about N. W. ½ N., the distance 20 miles.

"The land in the vicinity of the bar is very barren; on the north side of the entrance is a high red bluff, and also two rocks close to the water's edge; one of these has the appearance of a large gun mounted, with a small fort and flagstaff, and some huts close to it. These objects, together with the spit of sand on the S. E. side, the breakers across the mouth of the river, and the smoothness of the water within them, are good marks by which the entrance may be readily known.

"In proceeding towards the bar, a low spit of sand will be observed, which forms the S. E. side of the entrance of the river, and a ridge of heavy breakers, parallel to the shore for 2 or 3 miles, without any appearance of a passage. We approached them in our boat, and, perceiving a buoy, we soon got within the breakers, where we ascertained that this was not the channel used by the pilots, although there were 6 feet water in it at low water. The best channel is further to the N. W.; for, besides having 3 feet at low water, it affords an easier passage out, as it lies in a N. E. and S. W. direction; whereas the former lies nearly E. N. E. and W. S. W., and is very narrow.

"Both of these channels are liable to shift, and therefore every master ought to make himself acquainted with the state of the bar before he attempts to enter. Buoys or boats may be readily placed in the channel, or perches may be fixed on the spits or on shore. He should also know the time of high-water, and take the bar half an hour earlier. After passing the boat or buoy, that should be moored in the deepest water between the breakers, it will be necessary to haul up S. S. E. or South, to clear a bank on the west side that nearly dries at low water. (On this bank, as well as on that to the north-eastward of it, perches ought to be fixed.) So soon as this bank is cleared, the depth will increase, and a westerly course must be taken, in order to pass between the high sandy beach on the starboard, and a low bank that dries at two hours ebb, on the larboard hand. This channel, not a furlong in width, is by the pilots generally called the Funnel; and there are usually 10 or 12 perches along the edge of the low bank. Having passed this narrow channel, it is proper to haul to the southward, to get under the sandy point on the south side of the river, into smooth water. In advancing towards *O'Neil's Bank*, which must be approached with caution, keep the lead going, and tack in good time, in order to get close to the weather shore. The channel between this bank and the shore is deep and narrow, but after passing it, there is good anchorage in 3½ or 4 fathoms, where vessels generally anchor, when waiting for a wind or tide to go out.

"A vessel, whose draught of water does not exceed 10 feet, (and it would be imprudent to be much deeper for passing the bar) may sail up, at two hours' flood, to *Cook's anchorage*, where vessels generally load; and by waiting for more of flood, she may go 2½ miles still further up, and take in a cargo safely.

"*Sailing out of this port* is more dangerous than coming in, as the wind is only favourable for passing the bar during three hours in the morning, and even then it cannot be depended upon. Should it fail, or head in the least, the vessel would be in imminent danger, as a heavy sea is always running on the bar, and the channel is so narrow, that anchoring would be useless. When a vessel has been conducted through the *Funnel*, and as far down as the lowest perch, and being on the starboard tack, as much canvas should be set as she can carry, in order to give her good way over the shallowest part, and through the breakers.

"No vessel should attempt to go out, if it has been blowing hard the day before, as a heavy sea will then be on the bar, and probably the breeze not regular.

"According to the pilots and inhabitants of the place, the channels often shift. The banks being composed of quicksands, the river, when swollen with rains, forces its way through them in various directions, and sometimes forms new channels, so that there is no certainty of their being long in one position. It is also affirmed, that the channel is seldom deep enough till after the river has been raised by continued rains, and that, in the dry season, vessels may be detained for months, for want of sufficient water."

The old hydrographer, Pimental, gives the following description of the coast between Point Toiro and Aracati, viz.—"Off *Ponto das Pedras* (Point Irmaos of the modern charts) there are three shoals of rocks, having a channel between them and the main, of 3 and 4 fathoms; at 3 leagues outward are reefs above water (the Lavandeira on the chart.) Of the river Guamara (Aguamarea) to the S. W. the distinguishing marks are two inland sugar-loaf mountains, of unequal heights. To the west is Point Tubarao, then follow the rivers Amargosa, Cavallos, and Conchas. The coast hence trends N. W. to the Ponto do Mel, or Honey point, which may be known by its high red cliffs. At the river Upanema (Mossocro on the chart) the land is very level; and on the west of the river there are, as far as a field-piece can carry, red cliffs. Within the land is Monte Vermelhos, (Mount Tibao) a sugar-loaf hill. Ships, however, should not advance into the bay, as it is full of shallows.

"From the river Upanema, to the N. W., the next river of any consequence is Jaguaripe, which may be known by a round bare hill of sand, on the N. W., terminating in a rock below, and within land a mountain, having seven sugar-loaf points. Five leagues inland from the Jaguaripe rises the range of the Gumame mountains, which extend to 10 leagues east and west, commencing at about 3 leagues from the river Jaguaripe; the land for nearly 4 leagues, close to the sea, appears dark and full, with several openings close to the bays. At about half a league from the commencement of these openings are some white cliffs, in shape like a schooner, with all sails set, and head at east. So soon as this full land terminates, the coast assumes a more flat and level appearance."

From the mouth of the Jaguaripe to Point Macoripe, on the east of Ciara, the coast trends N. W. *true*, and the distance is 20 leagues. The Bay of Iguape, as described by Pimental, is about 5 leagues to the southeastward of Ciara, which now appears to have a village on it, forms a small harbour to the westward of some low level land. The bay is surrounded by some very steep cliffs, against which the sea breaks violently; here is a high and round rock, behind which is good sheltered anchorage, in 2, 2½, and 3 fathoms; and to the N. W. of it, you may anchor in the roll of the sea, having 4, 5, and 6 fathoms; there are also several pits made on the sand, where water may be obtained with ease and in plenty.

CIARA. The bay, on which this town stands, is formed by Point Macoripe to the eastward, and by the river Papina to the westward, an extent of about 3 leagues. It is extremely open, its greatest depth being 3 miles. Before the town, at the distance of half a mile from the shore, extends a ridge of rocks, within which small craft generally anchor, the entrance to the anchorage being round the eastern end of the reef. Point Macoripe has a battery and tower near the extremity, and is itself a high and irregular sand-hill, terminating in a point. The recife, or reef, forms a complete ridge, at a considerable distance from the shore, and it is to be seen at low water. It extends parallel with the shore for about one quarter of a mile, with two openings, one above, and the other below the town; a small vessel may come to an anchor between it and the shore, but a ship can bring up only in one of the openings of the ridge, or on the outside of it. A vessel coming in from the northward should make Point Macoripe, which is 2½ miles to the eastward of the town, with a small fort on it, and may thence bring up in 6 or 5 fathoms. On the appearance of a ship, the town fort displays a white flag upon a flagstaff.

To the northward of Ciara, about a mile from shore, is the Pedra da Velha, or Old Woman's rock, known even at high water by the breakers over it; within this, at half the distance, is another, called Lobvendo, and next, that portion of the recife or reef, within which and the beach small vessels may anchor. Eastward of the latter are three other rocky patches, of which the last is three-quarters of a mile to the west of Point Macoripe; and between this and the point is anchorage under the latter, in 5 fathoms.

The *inner anchorage*, above-mentioned, is between the recife, or reef, and the shore. You enter by the eastern channel, and go out by the western, when you cannot fetch out by the eastern one. Here a vessel lies, at low water, surrounded by breakers, except in the channels, and, as the pilots are very inattentive, it is altogether very dangerous.

Baron Roussin says, "Ciara anchorage cannot be considered as a harbour, being exposed to all winds between N. W. and E., which are frequent hereabout; but the ground is excellent for holding, from three miles off the land to the reef, which includes the inner roadstead. In the outer roadstead, at from one to three miles from land, are from 6 to 10 fathoms of water, bottom of soft sand-stone, covered with sandy ooze, and in which the anchor holds well. The coasters enter the inner road by two passes, formed in the reef, at 200 fathoms asunder,—the depth in these passes is about 13 feet at high water.

DIRECTIONS FOR CIARA, BY CAPTAIN THE HON. W. WELLESLEY, R. N. *(Nautical Magazine for* 1833, *page* 440.*)* "CIARA cannot be called a port, nor in any but a tropical climate would it be thought a secure roadstead. I believe it to be perfectly safe, particularly from December to May; and we have the precedent of several large ships, namely, the American frigate Constitution, during the war, and soon after, the Inconstant and Isis, English frigates, having laid there with impunity.

"When bound for Ciara, run down in the latitude of Point Macoripe, to which give a good berth, until the castle bears S. W., then run down direct for it, until Macoripe bears E. S. E.; do not go any further in, until a pilot comes off, which will be in a catamaran. There are four high mountains, about 5 leagues to the S. W. of the town, which may be seen when 9 and 10 leagues in the offing, by which the port of Ciara is easily distinguished.

"Point Macoripe is a sandy bluff, terminating abruptly enough at the sea. If you know your longitude nearly, it cannot well be mistaken, and the land on this part of the coast is tolerably high. Running in towards it, you will discover a reef breaking off, and inside of it, a good berth will open the town, and see the steeple, &c.

"From 11 and 10 fathoms (standing in for the town) you will shoal your water to 7 and 6, when you may anchor or heave-to, and wait for the pilot, should he be coming off. If there are any merchant-vessels lading, they will be well to the westward, protected in a small degree by a reef of rocks.

"The landing is very difficult and uncertain. It can only be effected from half-tide to half-tide, and then by the help of the town's people, who, with their negroes, are in attendance, to carry you out of the boat in a chair. This is owing to a reef of rocks (round either end of which is the boat-passage in) that lies in a direction parallel with the beach, and about 300 yards from it: these begin to appear at half-ebb, and then make a kind of break-water until half-flood, when the water dashing over them, creates a surf, in which it is impossible for a boat to live. The pilotage charged for the Sapphire was eight Spanish dollars.

"From this place I steered a N. W. ½ W. and N. W. course, along the land, at not more than 4 miles distance, in from 13 to 11 fathoms, until I came to the village of Curu, a distance of about 30 miles; when I got abreast of it, the decrease of soundings to 9 and 7 fathoms warned me to haul off. There is a heavy breaking shoal running off the point on which the village stands; and in case any one not knowing his longitude should make it, it may not be amiss to state, that we saw catamarans, with their sails hoisted to dry on the beach, which had exactly the appearance of large boats sailing upon a river, until the regularity of their distance, and a nearer approach dispelled the illusion. Hauling out for Curu, the water did not deepen for a considerable time. I made Curu to be in latitude 3° 28′ S., longitude 39° 0′ W."

From Point Macoripe the coast trends N. 56° W., *true*, to Mount Melancia, a distance of nearly 19 leagues. This mount, so called, is an insulated sand-hill, near the coast; all this coast is sterile and desert in the part next the sea, and shews no trace of culture nor inhabitants. The coast is clean, and at two or three miles from it are found from 6 to 13 fathoms of water, with fine grey sand. From Mount Melancia the coast trends N. 64° W., *true*, 11 leagues, to the village of Almufedas, then N. 69° W., 5 leagues, to Point Topagi. The village of Almufedas, standing within the sand-down on the shore, is situated on the border of a small river, Aracati Miram, navigable by coasters. From the offing its steeple may be seen among a group of cocoa-trees. This village serves to indicate the commencement of a bank, which extends thence nearly to the little hamlet of Jericoacoara, situate about 40 miles more to the westward.

Remarks. Captain Wellesley says, "If the land be fallen in with so far to the eastward as Ciara, it will be higher than any to the westward, and the magnificent mountains, some leagues inland, (the only fine feature on the northern coast of Brazil) will be seen. Point Macoripe, which forms the entrance of Ciara, may be known by its being a sandy bluff, terminating rather suddenly. But, upon whatever part you advance, it is just clearly discerned off the deck, that is, if your object be to make a free passage.

"If you come upon it towards the evening, and have run sufficiently near to make it out, as has just been said, N. W. by W. ½ W. will not be more than a safe course to haul off on for the night; or you may stand off to 22 fathoms, in about 2° S, and in to 17 fathoms. It is seldom, under any circumstances, that vessels find themselves further off the land than they expected in the morning.

"I was in less water than 10 fathoms the whole of the first night I was on the coast, but I would not willingly go so near again, being sensible not so much of the danger, as of the inutility of such a close approach."

Off Mount Melancia a bank commences, which extends all the way to the river Iguarassu, an extent of 45 leagues. This bank, which is called Praal de Caracu, extends outward about 3½ leagues from the shore, and is circumscribed by the depth of 6 fathoms; upon the bank, off Almufedas, there are 4½ fathoms, distant 5 miles from the shore, and at 9 miles north from Point Tapaji are 6 fathoms. From the edge of the bank, in 7 fathoms, the water gradually shoalens to half a fathom near shore. Those approaching may therefore advance safely, by keeping the hand-lead going. Large vessels, proceeding westward, should keep off at 12 miles from the land, the coast being so low, that at a safe distance the tops of cocoa-trees only can be seen, and in the finest weather. When westward of Jericoacoara, the draught of the vessel, and soundings, will determine the distance to which it may be proper to approach the bight.

Jericoacoara. Between Point Tapaji and the Point of Jericoacoara, the coast trends nearly east and west, a distance of 27 miles. Jericoacoara is a cove formed, by the broken ridge of rocks which borders the coast, into a small basin, between them and the shore. The waves frequently beat high on the reef, and break over it into the basin. By digging pits on the beach hereabout, potable water may be obtained. Spring-tides, in the basin, rise from 10 to 12 feet. The coast to the westward is a low shore of white sand, having without it the ridge or border of rock, beforementioned. Hence follow, the mouths of the little rivers Camusin, Tapuya, Temonha, &c. The first of these is the only one navigable for coasters of any draught.

PERNAIBAO, OR PARANAHYBA. That part of the coast of the province of Piauhy, extending from the Barra de Iguarassu, the easternmost branch of the Rio de Pernaibao, to the Barra de Tutoya, its westernmost, has generally been laid down incorrectly in the charts. The distance between these two mouths is about 30 miles, in which extent the Rio de Pernaibao discharges itself by four others, called the Barra Velha, Barra do Meio, Barra do Caju, and Barra das Canarias. The HARBOUR of TUTOYA, on the west, is the only harbour, along the extensive line of coast between Bahia and the Maranon, that admits of the bar being crossed at all times of the moon, by vessels drawing from 14 to 15 feet water.

The BAR of IGUARASSU and the BARRA VELHA, the two easternmost passages, have become unnavigable for ships; and in consequence of the formation of two sand-banks immediately to leeward of them, vessels must proceed to Tutoya, for which branch of the river a pilot may be obtained. The rock called Pedra do Sol, between the Barra Velha and Barra do Meia, as exhibited on our chart, Admiral Roussin says, "that it is not a danger really to be dreaded, being only a break of the reef on the coast, and does not extend more than a mile along shore." It is advisable not to approach the coast of the mouths of the Pernaibao nearer than to 4 or 5 miles, and not further in than to a depth of 8 fathoms; the sea is muddy, and the bottom of oozy sand before these passages; the ground is therefore bad for anchoring. At 4 or 5 miles from land, 8 or 10 fathoms may be found.

To the westward of the port of Tutoya the coast is not so high, but exhibits sand-hills of a shining white colour, without any verdure; these are called the *Lancoes Pequenos*, or *Little Sheets*, and occupy an extent of coast terminated by the river Perguicas, near which are some breakers.

THE RIVER PERGUICAS separates Lancoes Pequenos from the Lancoes Grandes. A long spit, extending from this river, is formed by the tide of the river meeting the current of the sea. The Sapphire, Captain Wellesley, crossed this bank by night in 5 fathoms, but in 7 fathoms a ship will be quite close enough. If the coast be made from the northward, about the Perguicas and Lancoes Pequenos, soundings will be struck in 19 or 20 fathoms, and soon after in 13; and from thence regular bottom will be found in 10 or 11 fathoms, until the vessel is close enough to haul off, and steer along the land. In keeping 8 or 10 miles from this part of the coast, you will be at sufficient distance to avoid all danger, and thus you will have from 7 to 14 fathoms. To the west of the river Perguicas, the coast trends N. 65° W. to N. 80° W. It resembles that which precedes it to the east. Its downs are of shifting sand, moderately high, and extending nearly 12 leagues. They resemble, in appearance, linen cloths, or extended sheets, and have received the name of *Lancoes Grandes*, or *Great Sheets*, in contradistinction to a range to the eastward, named Lancoes Pequenos, already noticed. This appearance is remarkable, and useful as a landfall to those coming in from sea, when bound to Maranham, &c.

To the westward of the Lancoes Grandes, the coast appears as if wholly covered with bushes and groves, so closely set, that at the distance of 4 miles the ground between them is not to be seen. The shore is low, and is called the Praya das Mangues Verdes, or Beach of Mangroves. The sudden transition of colour here, from that of Lancoes, renders it impossible to mistake this part of the coast.

Bank off the Coast of Para. In the "Annales Maritimes" for 1838, it appears, by a notice, that a French ship grounded on a bank off the coast of Para, the position of which, according to the account given, we can only suppose to be in latitude 2° 18′ S., longitude 43° 7′ W. of Greenwich. The following is the notice alluded to, which is an extract from a letter of Mr. Charles Leraistre, commander of the ship Emily, of Nantes:—"When passing the Lancoes Grandes, and N. by E. of the most remarkable sand-hill, 7 or 8 miles from the land, in 7 to 9 fathoms, at half-past twelve, *p. m.*, the Emily got into shoal water, upon a bank of 2½ fathoms, which appeared to be of small extent, around which I found 7 fathoms. The vessel was going two knots at the time, and at noon was in 2° 20′ 2″ S. latitude.

"This bank is very dangerous, because it is situated in the route that a large vessel would take, and at a distance from the land that would remove all apprehension of danger. It was low water when I touched, or thereabouts, and from aloft only one green patch of trifling extent was to be seen resembling others on those shores. Two of the shocks were rather violent, but not sufficiently so to produce great danger. The vessel made no water, nor do I consider the false keel was damaged."

ISLAND OF SANTA ANNA. This island is equally covered with mangroves and other trees; on advancing, you will see the breakers which lie about, and to the eastward of it, of which the easternmost are 8 miles from the N. E. point of the island. Near these shoals are from 7 to 24 fathoms of water, bottom of sand. The *Coroa Grande*, a vast flat of rocks and sand nearly even with the water, lie to the west of St. Anna's island, and extend about 5 leagues to the northward of Maranham island.

Light-house on Santa Anna Island. This light-house is a square tower, having three distinct towers, each story diminishing as it rises. The angles bear north and south, and east and west. Its height is about 90 feet above high water, spring-tides. In the day-time it has the appearance of a vessel under sail, at a considerable distance: by night it shows a revolving light, visible every 30 seconds, for about 10 seconds together; at a shorter distance the lights show as a permanent light, like a bright star, with a brighter light every 30 seconds. Between the continent and Maranham island is the inlet of Bahia de St. Joze; it is too shoal and dangerous, even for small vessels, for a passage to the port of Maranham; the bay of St. Marcos, to the westward of Coroa Grande, is therefore the general entrance. The tide sets with great strength into the Bahia de St. Joze. The flood from E. S. E., the ebb from W. N. W. High water at about 6 h. p. m.

Directions for the Navigation from Ciara to Maranham. From Ciara the coast trends N. W. by W., 35 leagues, to Point Tapaji, and thence west, 10 leagues, to Jericoacoara; but a N. W. course should be pursued, in order to avoid the shoal parts of the bank of Caracu. Having run about 34 leagues upon the N. W. course, allowing about 1½ mile per hour for the current's assistance, in soundings varying from 11 to 20 fathoms, alter the course to W. ½ N., and it will give you a sight of the land, as far as the island of St. Anna. Vessels coming from sea and bound to Maranham, should always endeavour to make the land considerably to the eastward, most particularly on account of the currents which prevail on the coast, always running strongly between W. ½ S. and W. N. W. If in endeavouring to make the land, they should be in latitude about 3° S.; on discovering it they will be off Mount Melancia, or between it and Ciara; or should they discover three mountains, lying nearly S. E. and N. W. of each other, these will show them to be still nearer to Ciara, for these mountains are only 7 leagues distant from Ciara; about this part of the coast you will have a bottom of fine sand and shells, but if they should make the land in from latitude 2° 15′ S. to 2° 30′ S., and have a bottom of small red and white stones, or broken pieces of coral, they will be off Jericoacoara; if the bottom consists of blue, red, and yellow stones, they will be off Paranahyba or Temonia, and three mountains in the neighbourhood of the latter will be seen.

The whole coast from point Macoripe to Paranahyba is sandy to about half a league inland, so that it is equally distinguishable from the coast between Paranahyba and Green Mangues (mangroves) point, which consists of nothing but sand, without the least sign of vegetation. Inclining to the shore, and observing the lancoes or sand-banks well as they proceed along, the entrance of the river Perguicas will easily be distinguished, and when that opening bears S.S.E., the water will begin to lessen in depth, and the hillocks on shore become somewhat larger and more irregular; being in 8 or 9 fathoms they will cross the spit or bar of sand, thrown out from, and accumulated at the mouth of the river, the stream of ebb from which turns the current somewhat to the N. W. here. Should night be approaching, haul up, and stand off and on till morning, in from 24 to 12 fathoms; it is advisable to pass the Perguicas before this be done, that with the dawn of the ensuing day they may pursue the same course, keeping the same distance from shore; for, by bearing up, under all the sail they can, they may have sufficient daylight before them to reach their destination.

Having passed the Lancoes Grandes, they will easily distinguish Green Mangues point, by the brushwood and re-appearance of vegetation; and when this point comes about S. by W., let them look out for the island of Santa Anna.* Bring it to bear S. S. W., and having so done, haul off N. W. by W., until they get into about 2° S., or a little to the southward

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* Captain Livingstone, in 1824, says, "A dangerous shoal exists at about 10 or 11 miles to the eastward of St. Anna's island. Many vessels have narrowly escaped it. We got into 3 fathoms, with St. Anna bearing W. by N. The bottom was of fine sand, in ridges, with even 10 fathoms between; but I have no doubt that there are also coral rocks, from the manner in which the sea broke, at a little to the westward of us. About the same time, a French brig in company, the *Cæsar*, of Marseilles, struck and unshipped her rudder, at about a mile and a half to the N.E. of us, though her master assured me they had never found less than 6 fathoms. We had one cast of only two fathoms, but did not touch; so the lead must either have hit the top of a coral rock, or else a knob of sand.

"*The Island of Santa Anna* shows quite level in the direction we made it, and I think cannot be less than 12 miles long, in place of two or three, as commonly laid down. I have spoken with many who concur with me in this opinion and one who has been on it, states it as 12 miles long, and 3½ or 4 broad. From the appearance of the island,* and the depths of water, both the French captain and myself thought we were on the Coroa Grande, or Grand Crown, to the westward; and, as night was rapidly coming on, we both anchored.—we in 19 fathoms, and he, at half a mile west of us, in 25 fathoms.

"THE CÆSAR SHOAL (so called by me, from the French brig above-mentioned) lies about two miles South, and as much East, of the place we anchored at, the evening after we were in such shallow water on it. The position of this spot I ascertained as follows:—Latitude, by mean of meridian altitudes of the stars, *Fomalhaut*, *Canopus*, and *Achemar*, 2° 10′ 13″ S.; longitude, by five sights of distances, of ☾ and ✱ *Aldebaran*, west of ☾ 43° 29′ 15″. By five sights of distances of ☉ and ☾, the sun east of the moon, 43° 29′ 0″. The accordance of these results may be considered as confirming their accuracy, and they corroborate those of Captain Hewett.

"The shoal I consider very dangerous, and think it extends three miles and a half, East and West, and three, North and South; but there is, at least, one other at a short distance south of it. It is to be observed, that the Cæsar shoal lies in the very track formerly pointed out in the Sailing Directions for making Santa Anna."

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* At this time, it is to be recollected, that the light-house was not erected.—EDIT.

of 2°, then stand on due west, and they lose sight of the island of St. Anna. At about S. S. E. they will be abreast of the Coroa Grande, then, keeping a look-out from the mast-head to the southward, should breakers be seen, or your depth become less than 18 fathoms, haul out half a point, but no more. By their N. W. by W. course, the distance to be run should be 13 miles; then, on the westerly course, 11 miles, allowing a mile an hour for the current, when they may proceed W. S. W., until they perceive Mount Itacolumi ahead, and the coast of Tepitapera to the larboard; and so soon as they see Itacolumi mount, which resembles a gunner's quoin, endeavour to bring to bear W. N. W., and, according to judgment, about 4 leagues distant;* then proceed, with the lead going, 4 leagues, when they will have St. Mark's point bearing south, at about 3½ miles distance. From the light-house, on St. Anna's, Mount Itacolumi bears W. ¾ N., nearly 15 leagues.

Baron Roussin says, "that the breakers of the Coroa Grande, with those of the island of St. Anna, may sometimes, in clear weather, be seen from the mast-head at 3 leagues off, and from the deck of a corvette or sloop, at half this distance. They are divided into several groups, and always show, although the tide rises 12 feet. The only difference in their appearance is produced by the state of the tide, or the greater or less elevation of the waves." The northernmost point of the breakers on the Coroa Grande is given, by the Baron, as in latitude 2° 10′ 50″ S., longitude 43° 57′ 32″ W. On approaching the Coroa Grande from the north, when the sky is not clear, you may distinguish the coast of Maranham island from that of St. Anna, by its being higher, its masses woody, and a bold white shore on the north.

MARANHAM. This island is about 10 leagues in length, and 5 leagues in breadth; and between it and the coast, on the west, is the bay of San Marcos, navigable in the greatest part of its extent for large vessels; and frigates may anchor before the HARBOUR OF ST. LUIZ, situate on the western coast of Maranham. The principal entrance of the bay lies N. N. E. and S. S. W., and being limited on each side by dangerous shoals, must be approached with caution. In this entrance, between the Coroa Grande on the east, and the continent on the west, is the *Middle Bank*, about 3½ miles long, N. N. E. and S. S. W., having over it from 6 to 2½ fathoms. Its western side is steep, and should be approached with caution. On the eastern side the soundings are more gradual, but the channel on this side is now much narrower than formerly. The Middle bank, latterly, has been described as connected with the Coroa Grande, being divided only by a swash between, of 7 to 9 fathoms. It is not the one by which vessels generally enter, the western one being the superior and ordinary channel.

ST. LUIZ. This city is situate on the western coast of Maranham island, and extends nearly 1½ mile in an E. N. E. direction. It comprises some small streets and squares, but is too much sheltered from the sea-breeze, with which it would be more salubrious. It is the capital of the province of Maranham, and is the seat of government, and of the bishop. The HARBOUR OF ST. LUIZ is formed by a creek in the island, and is to be entered from the bay of San Marcos, or St. Mark. The channel is of sufficient depth for common sized merchant-ships, but is very narrow, and not to be entered without a pilot. Opposite to the town, the water is shallow at the ebb. Vessels may find at Maranham the chief resources required by the exigencies of navigation. The safety of the port permits careening; the water is good and abundant, and on the island beef and rice are easily procured; but, if in want of considerable quantities, they may be most advantageously obtained on the Alcantra or continental coast, because this is, in every respect, more fertile than the island, and more abundant in cattle, fruits, &c.

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* Alcantra point will then bear S. W. ½ S., when they may anchor, if necessary. The channel here is wide, and the bottom sandy; in many parts the water will appear muddy, while in other parts it is transparent and clear; and at all times a kind of chesnut fruit will be seen floating about, which, in rainy seasons, drifts much further to seaward.

The Tides are regular at St. Luiz, and in the bay of San Marcos. At the anchorage before the harbour of St. Luiz, the flood sets to the S. S. W, and the ebb N. N. E. The velocity is one mile and seven-tenths an hour, in ordinary tides; spring-tides, two miles and a half. In the last case, the difference of level between high and low water is 16½ feet, according to observations, made 36 hours after the full moon of January, 1820, near Fort St. Antonio. In ordinary tides, the vertical rise of water is not more than 10 feet. High water in the harbour, on the full and change, at 7 h.

Sailing Directions. Vessels arriving from Europe or the West Indies, make the coast to the eastward.* The only exception is with winds, at times, between the north and the west; at all other times they can see the Lancoes Grandes. This shore of white sand may be seen to commence about 20 leagues E. by S. from the isle of St. Anna, and extends, as before-mentioned, to the green or verdant land about Mangues, or Mangrove point, under the meridian of 43° 28′ W. Off the coast, at 4 or 5 miles from the Lancoes Grandes, are from 5 to 6 fathoms of water; but, by an error of longitude, very likely to occur hereabout, they may easily mistake the Lancoes Pequenos for the Lancoes Grandes; but observe that, when off the latter, they will have the shoal grounds of the river Perguicas to the east, in place of being to the west, while off the former. To guard against all uncertainty in this respect, they must hold off to 10 or 12 miles from the coast, and continue their course from 6 to 10 fathoms, when they will be between the parallels of 2° 15′ and 2° 30′ S., on a mean direction of W. N. W., which is that of the coast.

Having arrived at the meridian of 43° 12′, and at 7 or 8 miles from shore, they must shape a course northward, in order to avoid the St. Anna's breakers, which exist as before described. In this traverse, the tide will require attention, and a due allowance must be made for it, according to its direction and strength. The flood, on this part of the coast, sets to the S. W., and the ebb to the N. E., sometimes with a velocity of two miles in an hour. When passed the breakers, to the north of the isle of St. Anna, which may be known by the light-house, continue to steer to the west several degrees north, until you come in sight of the breakers of the Coroa Grande, which may be approached to the distance of two miles. Having passed within sight of these breakers, they will find soundings of fine sand, with black and red specks.

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* Vessels making for the S. W., when approaching the equator, must particularly observe, that near the longitude of 41° lies a dangerous reef, the existence of which cannot be doubted, though the exact longitude is not known. On the 15th of October, 1819, the brig Richard, of Ulverstone, Captain Blaesdale, struck on this reef, as will appear from the following abstract of the Richard's log:—"Friday, 15th October, 1819; fine moderate weather, ship going three knots. At 6 p. m. grounded; did not remain fast above 10 minutes; water smooth, saw no breakers. In a few minutes after, sounded, but got no bottom, with 125 fathoms of line, latitude, at noon, by good observation, 0′ 57″ N. Run west, until 6 p. m., longitude 41° 22′ W. The vessel drew 11 feet of water; in one hour there were 18 inches of water in the well. When the ship arrived at Para, whither she was bound, three holes were found, each about the size of a man's hat, and nearly through her bottom, and several large pieces of white coral were sticking in different parts."

San Marcos, or St. Mark's point, is the first point of Maranham, which will be seen to the southward. It is a high bluff point, and on it is a guard-house and signal-staff; from it a broad shelf extends to the S. W. of the point, with flats of rock and sand, to more than 400 fathoms from the shore, which must therefore be approached with caution. On continuing the route to the S. W. and S. W. by S., they will make the parallel of the Point das Arcas, which is the north point of the entrance of the harbour of St. Luiz. On it is the little fort called San Antonio de la Barra. This point should not be approached nearer than half a mile, at which distance are 6 and 7 fathoms, where they may anchor.

The best and most frequented route to St. Luiz is taken by gaining a sight of Mount Itacolumi, before-mentioned, situated upon the western coast of the bay of San Marcos, nearly on the parallel of the north part of Coroa Grande. On approaching this mount it appears in the shape of a gunner's quoin, and is remarkable only from the low land in its vicinity. From the lighthouse on St. Anna's island, it bears W. ¾ N., nearly 15 leagues. When this mount is descried, shape a course to bring it to bear W. N. W., and, according to judgment, about 4 leagues distant; thence proceed, with the lead going, S. by W., 4 leagues, when you will have St. Mark's point bearing south, at about 3½ miles distant. On approaching this point, a sand-bank, dry in many parts, will be seen at about two miles N. N. E. of it; the Banca de Cerca, or Acuas bank, to the westward, will also be seen breaking in many parts. Between these is the channel to St. Luiz Roads. On passing San Marcos point, the rock will be seen to the westward of it; but by giving them a sufficient berth, and bringing the body of the Isle do Medo to bear S. W., and the fort on Ponto das Areias S. E., they may anchor in 15 fathoms, sand and mud. On the foul ground, off San Marcos point, many anchors have been lost.

The best anchorage before the mouth of the harbour is nearly a mile from Fort St. Antonio, or Ponto das Areias, with the fort bearing S. E. by E. ¾ E. In this position there are from 30 to 45 feet of water at low ebbs. Small vessels go higher up toward the bank of the Isle do Medo. The anchorage before St. Luiz is bounded on the S. and S. W. by the Ponta da Guia, Isle do Medo, and several shoals, on which there is little water at low tides. Besides the passage on the N. E. of the bank, leading to the anchorage, there is another on the S. W., between it and the Isle do Medo, but the latter is taken only with winds between north and south by the west. The entrance of the harbour of St. Luiz is not difficult for small vessels, but those of greater draught must have a pilot. Vessels, whose draught will not allow them to anchor in St. Luiz, may anchor in the little bay of Artaki, S. W. of Maranham, having a bottom of mud or ooze, with 15 or 16 fathoms of water, the current less rapid than before St. Luiz, and the sea always smooth.

Remarks on the passage to Maranham, *by Capt. the Hon. W. Wellesley.* "The best part of the coast for vessels to make is the Lancoes Grandes, or Great Sheets, because the whiteness of those sand-hills is so remarkable, and extend so far. They commence in about 42° 45′ W., and terminate in 42° 12′ W. Run boldly for the centre or western extremity, and you will probably at the same time make the green country, about the Mangues point, with the light-house on Santa Anna's island, &c.

"In proceeding for Maranham, it is supposed that the land is made in the morning, about the Lancoes Grandes, you will be running down to near the land, probably on a W. by S. course. Having seen it clearly, haul off to W. N. W., and having arrived at their termination, you will run about 10 or 15 miles along a coast nearly quite green, the "Mangues Verdes;"

from the mast-head, St. Anna's light-house will be in sight, as you run along, bearing perhaps about S. W. by W. It will be seen before the island on which it stands, and makes like a vessel under sail; you are not sure of making the island itself, until Mangues Verdes point bears S. by W., and it is essential to bear in mind that the light is not on the northern extremity. The dangerous shoals which run in a N. E. direction off it will now be made out, and if you think the flood is setting you in, haul off in time to N. W. by W.

"The tide sets remarkably strong into the bay of San Joze. The first time I ran along the coast, it set me inside the reefs, and obliged me to anchor in 5 fathoms; and I was compelled to stand out on a N. E. course to get clear of them. The breakers, however, always show themselves. They should be rounded in not less than 14 fathoms.

"Having brought these dangerous shoals abaft beam, a W. ½ N. course may be steered with safety, until the Coroa Grande breakers are passed. Lieut. Hewett recommends a N. W. by W. course, but I steered W. ½ N. on the flood, in perfect safety, making the two breakers; and steering the same course upon the ebb I was obliged to keep away W. S. W. to make them.

"The Coroa Grande shoals always break; and I think it better to make them, because you get a fresh departure, which is advantageous if night be coming on, and you wish to anchor. If you do not wish to make them, W. N. W. may be steered for 15 or 20 miles, and then west, until Itacolumi is seen ahead. The mountain is the highest land on the coast, and makes at first like a small round island; almost immediately afterwards the adjacent land appears, and then it takes something of the shape of the quoin of a gun. I think 15 miles the very utmost distance at which this land can be seen, and it is likely you will not be more than 10 or 12 miles off when it is reported from the mast-head. The less water you have the closer you will be to it.

"If in approaching you should have as little as 9 fathoms, or less, haul off to the south, and gradually keep away again to the S. S. W. when you deepen the water, which course will take you up to St. Mark's fort. If on making it there should be a depth of 14 fathoms, S. S. W. may be steered at once. In running up this course, bear in mind that the flood sets towards Alcantara, and over the Cerca bank, and the ebb, on the contrary, will check you over to the middle bank, and towards the edge of the Coroa Grande.

"Look out now for St. Mark's point ahead; it ought to bear from S. by W. ½ W. to S. W. by S., and if you are in the centre of the channel you will hardly get soundings with the hand-lead; if you have as little as 9 or 10, you will be on the edge of the middle bank, and, as a precaution, should keep half a point or a point more to the westward; 14 fathoms is a very good depth to run up in all the way. I have had no soundings until the anchor was let go off Fort St. Antonio, in that depth.

"The land about St. Mark's, when first seen, makes like two small islands, the easternmost one having two sand-hills upon it, which look like two roads. The round fort and flagstaff soon appear, for which keep the ship's head, and Fort St. Antonio will be seen like a long low red house, a little to the westward of St. Mark's. When you are within a mile of this latter fort, run along the land, until you bring it to bear N. E. by E., and Fort St. Antonio E. S. E., there drop your anchor in from 10 to 14 fathoms.

"When near the anchorage the only danger to be apprehended in a large ship is from the Banca de Cerca, which lies about a league off shore, and the northern point of which lies about west from St. Mark's; unless there be a very strong tide running, or the ship is beating up, you do not come near this; if you should, however, the soundings decrease very gradually, and indicate its vicinity.

"In beating out the pilot took the Sapphire over its north end in 5 fathoms; and at low water there may be over its centre as little as 16 feet; but of this I am not positive. It lies somewhere about north and south, and one of the marks for clearing it, is, not to shut in with Point Ataki the two small islands which lie off it.

"It seldom happens that vessels have to beat from Itacolumi to Maranham, the wind being almost constantly to the eastward; but they have to beat out usually. One tide ought to bring the mount to bear from W. N. W. to West, when the pilot leaves.

"They go about in from 9 to 12 fathoms on either side; twice we were off the Carnaveiros or Pirajuba banks, which were found to extend out further than laid down. The Baron Roussin's soundings are correct, but perhaps he gives a little too much water in certain places. His details of the coast, such as the entrance to rivers, and other minutiæ, are sometimes erroneous; but it must be recollected, that his was a survey made under sail. The eastern channel has latterly grown up, and is now disused by all, excepting small coasters. Having once sighted Itacolumi, it would be difficult to get a vessel into the eastern channel, so much more simple and direct is the route by the western channel." *Nautical Magazine for* 1833, *page* 438.

Remarks *on the passage from England to Maranham, by Lieut. E. Stopford, commanding H. M. Schooner, Pickle.* "Vessels bound to Maranham may cross the equator in longitude 40° W., which will enable them to fetch the Lancoes, a landfall deservedly recommended by Baron Roussin.

"It has been customary to make the lighthouse on the island of Santa Anna, but an error in the longitude will be of less importance by making the Lancoes Grandes. A vessel arriving off Santa Anna, and not having sufficient daylight to find her way into the bay of St. Mark, may lay-to for the night, off and on the lighthouse, keeping it as near south of her as possible, distant 6 or 7 miles. The light is revolving, and can be seen distant about 15 miles. As there is constantly a heavy swell on the coast, anchorage should be avoided if possible, as it is both difficult and dangerous to recover the anchor.

"From Santa Anna a vessel should steer W. ½ N., by doing which she will pass the breakers of Coroa Grande, at the distance of about 3 miles, and Mount Itacolumi will be discovered bearing about west. When distant about 10 or 11 miles from the mount, alter the course to S. ½ W. till the fort and flagstaff of St. Mark's are made out nearly ahead. St. Mark's point should not be passed at a greater distance than a mile and a half, that the Cerca bank (on the starboard hand going in) may be avoided. A reef of rocks runs off from the point, and to avoid these, it should not be approached within three-quarters of a mile. Within these limits a vessel may coast along, until fort Antonio bears East or E. by S., when she should anchor, and wait for a pilot. A vessel by following the above route to Maranham, will avoid getting entangled among the swashways, on the Coroa Grande shoals, which are very dangerous.

"The inhabitants of Maranham, in consequence of their harbour filling up, expect to be obliged to transfer their port of shipment to Alcantara. Lieut. Stopford visited this port, and is of opinion, that it is preferable in every respect to Maranham, being easier of access, capable of containing more ships, and allowing them to get in or out at any time of tide, with the prevailing winds. The depth of water is also greater. The Pickle was anchored about one-third of a cable's length from the shore, in 7 fathoms, at low water, being more than in any part of the harbour of Maranham, even at high water." *Nautical Magazine for* 1832, *page* 509.

MARANHAM TO PARA. The coast from the bay of Maranham to Para is generally low and sandy, but covered more or less with woods. It has many little isles of the same description, with several coves and rivulets. It is proper when a vessel is bound from Maranham to Para, to take her departure in the morning, and advance to the anchorage off the Aracaji, or cliff before described, thence stand out to sea to beyond the carnaverous banks, which may be effected in a run of 8 leagues. Having passed these, you approach the sand-bank stretching from the western shore, and over which there are 6, 10, 7, 5, and 8 fathoms. Thus you may proceed to the N. N. W. or N. W. by N., to the distance of 22 leagues, when the ground of the bank, white sand, with black specks, will be succeeded by coarse sand and stones, or brown sand and broken shells, with 13 to 17 and 20 fathoms of water. Here you will be off the island of St. Joao, and near the parallel of 1° S.

St. Joao, or St. John's Island stretches N. E. and S. W., 8½ miles. It is nearly level with the sea, intersected with several creeks. Between the N. E. end of this island and Point Turivazo to the W. N. W., the distance is about 9 leagues. The bay between affords shelter, and vessels may anchor off the N. W. side of St. Joao island, in from 10 to 5 fathoms, sandy ground. The Hon. W. Wellesley says, "There is anchoring ground in 9 fathoms, westward of the island, with the shoal off it E. N. E. ½ E., the west end S. ½ E. There is a better anchorage at about a mile off shore, with the woody point not open of a river to the northward of it. Here the tide runs very strongly N. E. and S. W. High water about 6 h. 24 m. p. m.

N. W. by W. ½ W. from Turivazo point is Cape Guarapi, distant 15 leagues, over which is a mountain, insulated, and therefore remarkable; the coast here, as in other parts, is, however, low, level, and sandy, covered with a dark brush-wood, and from the point a shoal with breakers extends three miles out to sea. From Cape Guarapi to the river Caita the distance is 16 leagues, on a course nearly west; at the entrance of this river are several low islets; off the shore the bottom is generally flat, and there is commonly 7 and 8 fathoms, at three leagues off, with clear ground.

From the river Caita to the inlet of Maracuno the distance, W. by N., is 12½ leagues. In sailing along it is advisable to keep two or three leagues off shore, in soundings of 7 and 8 fathoms. The coast here is distinguished by a range or chain of white sand-hills, the highest of which, Piranson hill, is about 3½ leagues, westward of Caita point; this hill appears like a high bluff and perpendicular point close to the sea, with red cliffs on its eastern side. At 5½ leagues, W. by N. from Piranson hill, is Point Atasia, and immediately west of the point is the inlet or bay of Maracuno, having 5 or 6 fathoms.

Rio Para. Point Tijioca, the eastern point of the mouth of the Para, is 12 leagues west from Atasia point, and within it, to the S. W., is Point Taipee, at the distance of 3 leagues. Here an extensive bank, called the Baxo de Boronco, extends two leagues from shore; between the two points, and to the northward, are the Braganza bank and the Tijioca shoals and breakers; the passage in is between these shoals, and has a depth of 14, 12, 11, and 15 fathoms, at about 12 miles from the southern shore, in latitude 0° 23′ S. There is also a channel for small vessels at 6 miles from shore, and along the edge of the Baxo de Boronco. The distance from abreast of Point Tijioca to the anchorage at Para is full 20 leagues; all the western side of the river is shoal, but on the eastern side are even soundings of 8, 7, 8, 9, 10, 7, 10, 12, 9, 7, and 6 fathoms: in the basin itself are from 5 to 3 fathoms.

Coming from seaward, with good observations, you may cross the equator on the meridian of 45°, where soundings from 50 to 40 fathoms may be found; hence a W. by S. course will lead towards Maracuno inlet, to the eastward of which a pilot may be obtained. The soundings over the bank decrease gradually from 40 to 15 fathoms. The flood sets into Rio Para at the rate of four miles an hour; the beginning, from the eastward, is very rapid, and it veers gradually to the N. E. and North. The vertical rise is 10 feet.

Ships outward bound from Point Taipee should steer according to the tide, keeping that point S. E., until distant from it 15 or 16 miles. Cape Maory will then be in sight; haul up N. E. or N. N. E., taking care to avoid the shoals of St. Rosa. The winds are generally from the eastward, and blow in squalls. The beginning of the flood sets from the eastward very rapid, and veers gradually to the N. E. and North. In thick weather, when Cape Maory cannot be seen, you may discover your approach to the banks of St. Rosa, by the soundings becoming irregular, which is not the case to the eastward of the channel. Keep the weather shoals on board as much as possible.

Whoever is bound to Maranham or Para should make the land in the months from December to July, because high winds seldom prevail, and the shores then appear clear and bright; but from July to November a constant fog envelopes the land, and the higher the tempests, the thicker and more hazy the atmosphere appears. The winds most prevalent on this coast are the N. E., E. N. E., and East, which are all fair for going in or out of Maranham and Para.

REMARKS *on the passage from Maranham to San Joao, Salinas, and Para, by* CAPTAIN THE HON. W. WELLESLEY. "On leaving Maranham, for San Joao island, I steered N. and N. by W., until nearly on its parallel, when, hauling in to the westward, I made the eastern part. The land here may be known by a small white patch, of exactly the same colour as the Lancoes Grandes. It is very remarkable, for the surrounding country has verdure about it, and the sand is whiter, and has altogether a different appearance. At these Lancoes is the narrow passage between San Joao and the main. The eastern or north-eastern is pretty bold; I approached it to about 4 miles, and it being calm, and a strong tide running, I anchored in 9½ fathoms.

"Continuing along you lose sight of the Lancoes, and come to the eastern point, which is low, sandy, and has a shoal off it which always breaks. I rounded this in 10 fathoms; on approaching it, over the sandy ground, a green and woody point appears, which has a peculiar shape, from the trees at its extremity being withered or stunted; it seemed to me, at first sight, as if a mist were coming over the land I am thus particular, because the sight of this point, or rather the certainty of it, is requisite to take up a good anchorage. It should not be brought to bear to the southward of east; and you should not open a river, the entrance of which is just to the southward of it. But the best anchorage by far, is to round the breakers in 10 fathoms, and anchor at about a mile from the shore, in not less than 8 fathoms, and tolerably close to them.

"I would here warn future navigators, who are making the coast, or leaving Maranham for the coast to the westward, to choose 3 or 4 days after the full or change of the moon for the time of starting, as the tide runs so very strong. In the Sapphire it happened that we entered this anchorage during their greatest strength, and upon the flood. Many of the shoals only shew upon the ebb. We were driven upon their edge, and anchored in 7 fathoms, supposing ourselves in a safe position. When the tide turned breakers were discovered within 20 yards of us; and it is probable, had not the wind and tide favoured us, we might not have got clear without difficulty. The tide was found running full 4 knots.

"Having been once at San Joao I should have no hesitation in taking the ship in again; but I would do it with the ebb tide, and, if possible, the quartering of the moon.

"Fresh beef may be procured in abundance at the hut to the southward, where dwells a Brazilian to take care of a quantity of cattle, the proprietor of which lives on the main land. The best landing is just round the south point. You may also land at Woody point and cut fuel; but, if you remain there during the flood, you will hardly pull through the entrance of the river, the tide runs in so violently. I did not see any fresh water: that which divides the island into so many parts is brackish.

"From St. John's to Salinas the land is low. I steered N.W. by W. and N. W., until I had passed Cape Gurassi, off which extends a shoal of 3 miles, or as some say more. I am given to understand that this bay is not so deep as laid down in the charts, and that vessels mostly anchor off the shoals. There are generally a number of troops at Gurassi, and sometimes a Brazilian man-of-war. Diamond mines are in the neighbourhood.

"From 13 to 15 fathoms is a good bottom to run along the coast in; at this depth you are always well off the land. Whenever I ran in with the land the soundings were found to decrease very gradually to 12, 11, and 10 fathoms. We had the wind at north, which enabled us to lie off the land.

"Until I arrived at Mount Atasia, (Atalai point) the only points I distinctly made out were Caiti, which is a long, low, green point, and Mount Piranson, which may be known by the red cliffs about; but you must be pretty close in to make the red out clearly. The directions in an old book say that Mount Atasia has a watch-tower upon it, with a gun, which is sometimes fired, when a vessel is seen approaching. This is not the case at present, whatever it might have been formerly. I have heard there is an old unroofed building standing, but I could not see it at three miles distance: this is essential to know, as, running down the coast without a pilot, one naturally looks for what is said to be a guide for Salinas.

"Mount Atasia is rather a high point,—with reference to the land around it, and there are two or three remarkable patches of land on it; and to the eastward, between it and Point Caiti, coming from seaward, it makes very distinctly;—the point and white patches cannot be mistaken. From the eastward its extremity makes like an island, and a white patch and point, about 8 miles from it, might be mistaken for the mount itself. I anchored off this patch in 10 fathoms.

"Running any distance at 5 or 6 miles from the shore, Salinas, the pilots' station, is difficult to make.* As you open the land to the westward

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* The pilot signals at the village of Salina, in 1832, were as follow:—

1. A flag, hoisted on the flag-staff, is the day signal that a pilot may be obtained.

2. If the pilot should not, however, come off during the day, and at night there be shown two lights, the pilot may be expected off the following morning.

3. If there be three lights shown the pilot has no boat, and must have one from the vessel to bring him off; in which case the vessel must bring the village of Salina to bear S. S. W., in soundings of 5 or 6 fathoms of water, when POINT ATALAYA (improperly called ATASIA) will be distant about 5 miles. You may hence dispatch a boat, well manned, which must keep close in with the shore of Atalaya, clear of the surf, until it meets with an opening in the reef,

of Atasia, looking carefully, a small white house will be discovered, with a red streak behind it. The white house is the chapel, and the red the tiled roofs of the cottages. It stands upon ground rather greener than the surrounding country. I observed it to make better coming more directly from the northward, the whole village presenting a larger appearance.

"The best anchorage is with it bearing from S. by E. to S. E. by E., in from 7 to 13 fathoms of water. In the Sapphire we anchored with it bearing S. by W., (off a spit which runs off Atasia) in 7 fathoms; but the ground is foul at this anchorage.* In sending a boat ashore the best passage in is between two breakers, a little to the westward of the village; opposite to it is a very heavy surf.

"From Salina a W. N. W. course leads you clear out to Maranduba, which is a sandy point. We kept away afterwards to W. by N. and then to West, running in from 7 to 13 fathoms; and, when Point Caraua (a low green point, which came in sight when Maranduba was on our beam) bore south, we saw the Braganza breakers. They always shew themselves, and you may run round them by your eye, in 9 or 10 fathoms. In rounding them, we kept gradually away from W. by S. to S. W., and then to S. W. ½ S. and S. W. by S., to run up the river. In running up Point Taipee should be noticed, with a small islet off it, for it is from this point that a departure is taken by the pilots on leaving the river.

"Bahia do Son and that of St. Antonio are the places preferred by the pilots, for anchorages, going up or down. At other parts you are not so safe, being very liable, owing to the foul bottom and ground swell, to lose your anchor, or snap your cable. The same observation applies to the coast in general. It is better, if there be sea-room, to stand off and on, than to run any of these risks. Off Para it is better to anchor close to the town; the nearer you are the deeper the water. The tide runs very strong; but, the water being shoal, 30 fathoms on each chain is enough to moor. The large mooring swivel supplied to Her Majesty's Ships is recommended to be used.

"Fresh water is procured alongside, which is of a very good taste; but, being somewhat dirty, or rather muddy, it should be strained through bunting, in running into the tanks.

"On leaving the river Para the western channel is, in this case, most commonly used. Having brought Point Taipee to bear from S. by E. ½ E. to S. S. E. the pilots steer north, which takes you out clear of all the shoals. When you are clear pursue a north course, if possible, and you need think no more of the coast; but if the wind is foul, no immediate danger need be apprehended at from N. N.W. to N. E.; but, in this event, it will be better to anchor, should the wind be light, and the flood-tide be running. On leaving Para you may expect a strong northerly current, until you attain the meridian of Cape North. It set the Sapphire, for two days, at the rate of a mile and a half an hour. Afterwards she experienced even a

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which lines the coast in front of the village, through which it must pass. Inside the reef the water is quite smooth, and you may land anywhere upon the beach.

4. The boat should be sent at half flood, in order that it may return the same tide. It is high water here, on the full and change, at 7 o'clock, and off shore at 8.—Lieut. E. Stopford.

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* From this anchorage Salina bore, S. by W. ¾ W.; Macussani, W. S. W.; Point Atasia, nearly South. The best anchorage is with the pilots' station S. E., in from 9 to 13 fathoms, and not less than 4 miles from shore.

stronger westerly one, against which precautions should be taken, if a course be steering for the West Indies." *Nautical Magazine for* 1833, *page* 499.

Captain Courtenay, R. N., represents the bottom, along the whole line of coast, as being composed of quick-sands, to which he attributes the frequent loss of anchors by vessels. Lieut. Stopford is of a different opinion, having frequently anchored on all parts of the coast, between Maranham and Para. It is, however, indispensable that vessels should ascertain the quality of the bottom, before anchoring, as it is foul in many places. The Pickle lost her small bower, before Lieut. Stopford was aware of this, by anchoring on rocky ground. Vessels should be careful not to anchor off St. Mark's point, as the ground is foul, and many anchors have been lost there.

REMARKS BY LIEUT. STOPFORD, *of H. M. Schooner*, *Pickle*, 1832. "A vessel bound from Maranham to Para, during the rainy season, should get to the northward of the equator, as soon as possible; she will thus avoid the light baffling winds and calms which prevail in this season, and also the current, which sets from E. N. E. to S. E. about 2 or 3 miles per hour, occasioned by the water from the various rivers and bays of the coast.

"To the westward of the island of Salina there are some white cliffs, so nearly resembling those to the eastward of that island that they have frequently been mistaken for each other. Vessels, mistaking the western cliffs for those east of Salinas, have stood on until they have been lost on the Braganza shoal, or in that equally dangerous place, called the Well. Lieut. Stopford has been informed that nearly all the losses that have occurred, at the mouth of the Amazons, have arisen from this cause. The utmost caution is therefore necessary to attend to the following directions for anchoring at Salinas:—bring the town of Salina to bear S. by E., and anchor in 9 fathoms. The whole coast from Turivazo is woody, and the white sand-hills are very remarkable.

"H. M. S. Pickle remained at anchor one night, in 7 fathoms, with the town bearing S. by E., and had no difficulty in regaining her anchor in the morning. Lieut. Stopford observes, that accidents frequently happened, and lives have been lost, by boats going for the pilots being swamped in the surf. They have frequently landed immediately under the town, which is very wrong; and Lieut. Stopford recommends them to pass to the westward of the island, where boats may land in safety, and thereby avoid the surf outside."

DIRECTIONS FOR VESSELS BOUND TO THE RIVER PARA, BY CAPTAIN R. THOMAS, *of the brig Margaret Richardson*, *of Glasgow*. "When bound to Para, from the northward, vessels should cross the equator in 46° W., then steer S. W. until they arrive in 0° 28′ of South latitude; soundings may then be found in 17 and 20 fathoms, fine sand, with small specks; steer a west course from thence, keeping the lead going, and do not approach the shore nearer than in 12 fathoms water; white sand-hills, to the westward of the bay of Caita, will soon be seen, appearing from the mast-head like breakers, at the foot of high mangrove trees. The land of Caita must not be approached, for the water is very shallow, and the soundings very irregular off this bay; and the flood tide sets in to the west. By steering a west course, and keeping a good look-out, Point Atasia will soon be seen; it is the highest land on the coast from Mount Guarapi, with steep red cliffs at the end and to the westward of it.

"About two miles further to the westward is the village of Salinas. The pilot-station is situated on a steep cliff, and the houses covered with red tiles. Near the middle of the village a church, with the steeple may be seen.

"Abreast of this point, distant from it about two miles, is a bank of hard sand and stones, with 4½, 5, and 6 fathoms water; this bank extends to the eastward as far as Caita, and the west end bears south from Salinas. Within this bank is a channel with 9, 10 and 11 fathoms water, soft mud, but, being so near the shore, I would not recommend it.

"After having reached Salinas, the pilot-station, should the weather be fine, and light winds, I would advise anchoring with the village to bear S. E., and not in less than 9 fathoms; for should it come to blow, during the night, which is often the case in the rainy season, and a vessel should part her cable, she will have sufficient room to make sail, and stand to the northward under easy sail, until morning; and, by that means, will avoid the reef which lies off the island of Praia Grande, the nearest island west of Salinas. Should it be blowing strong on arriving off the pilot-station, and past noon, I would recommend a vessel to lie off and on, under easy sail, until next morning, for it would be too late to attempt to run for the banks.

"In leaving Point Atasia, for Para river, I recommend making sail early in the morning, steering W. by N. ½ N., keeping the lead going, and being very cautious in steering and sounding, as the tides here run very strong, and are very uncertain in their direction, owing to the many small rivers and banks adjacent. A vessel should not come nearer the shore than 10 or 11 fathoms, until she comes abreast of Maranduba, or what some call False Salinas. It is the second island after passing the village, with two white patches, or sand-hills, much resembling, in appearance, the sand-hills to the eastward, but smaller.

"These two sand-hills have been mistaken by strangers, and have proved fatal to many valuable lives, for there is no landing in their vicinity. It was off here that the brig Warrior, Captain Manse, in 1827, unfortunately lost his mate and three men, by the swamping of the jolly-boat, in attempting to reach the shore in search of a pilot. Having passed these sand-hills, continue a course towards the Braganza banks, or breakers, still keeping the lead going.

"From thence to the banks, while in the fairway, 13, 15, and 17 fathoms will be found; and when these sand-hills bear about S. E. by E., the breakers will be seen from the mast-head, on the larboard bow. These breakers must be left on the larboard hand, about half a mile distant. The channel here, between the Braganza banks and Tigioca shoals, on your starboard hand, is not two miles wide. Having reached the breakers, which is the only guide for entering the river, a vessel may steer a little more southerly, keeping the lead going, for she will then have 15 fathoms, foul ground, in mid-channel; having got well round these breakers steer a S. W. ½ S. course up the river, keeping the larboard shore on board.

"The foregoing directions are the result of my experience in 17 voyages that I have made to Para. I never once saw the tower on Point Atasia, and the opinion that a gun is fired, when a vessel approaches it, is quite erroneous."

General Remarks on leaving Maranham and returning to Europe. In leaving the port of Maranham, and proceeding northward, a favourable wind is required; and, care must be taken, in order to avoid the dangerous shoal of Manoel Luiz, hereafter described. The combination of tide and current, hereabout, renders it necessary to be very circumspect when leaving the bay, or in sailing between it and the shoal of Manoel Luiz, as the streams may be variable. In supposing the winds to the

East, N. E. to E. S. E., which are the most frequent, you must take the starboard tack on quitting the roads, and then endeavour to steer so as to make good the route of N. ½ W.

It is necessary to get under-way at the precise moment of high water, so that the first tack may carry you clear of the Cerca bank,—an approch to which may be known by a sudden change of depth, from 15 or 16 fathoms to 8, and even 5 fathoms, in the interval of time required for heaving out and drawing in the lead. The Cerca bank is narrow, situate in a N. E. and S. W. direction. When on the northern extremity, in 9 feet, at low water, the eastern side of the northern islet, Espera, appears in a line with Point Ataki, and the point of St. Mark, S. 56° E. Beyond this, the first tack, toward the west, may continue, according to the wind and the tide, the ebb being still favourable. The latter sets to the North and N. N. E. in all the extent of the bay; and one ebb may suffice for carrying the vessel out, provided it be taken, as before-mentioned, from the moment of high-water. Small vessels may approach the coast, on the west, to the distance of 2 or 3 miles; but it is not prudent for large vessels to advance so near, or in less than 12 fathoms.

Having completed the tack, to the depths prescribed, and hauled to the eastward, the depths will be found to increase, and probably the second tack to the north will accomplish the passage outward; but, should it be otherwise, continue to tack while the ebb continues, never lessening the depth under 12 fathoms, and taking every precaution not to approach too near the middle bank, which is steep-to. The rapidity of the stream will be found proportionate to the depths; and the middle of the channel being deeper than the sides, it is, consequently, in mid-channel that the tide is most favourable.

Should the winds blow from the S. E. or S. W. quarters, at the moment of departure, the most convenient route will be along the Maranham side and the bank of the Coroa Grande; but the channel to the eastward of the middle bank requires caution. The leading mark, to clear the eastern side of this bank, is the tower of San Marcos S. S. W. ½ W., until the Morro, or Mount Itacolumi, bears N. W. by W. ¼ W., when you will be clear of its north end, and may proceed according to circumstances. The pilot employed in conducting vessels outward is generally discharged at 2 or 3 leagues to the eastward of Mount Itacolumi.

Shoal of Manoel Luiz. The only obstacle to be feared and avoided, on the route to the northward, is this dangerous shoal, which lies in the true direction of N. 8° E., nearly 26 leagues from Point Itacolumi. Baron Roussin was the first that explored and ascertained its position, in 1820, and found it to consist in several groups of conical rocks, even with the water, situate in a sea rarely exposed to violent winds: this reef breaks only in short intervals, and at low water. It is, therefore, almost impossible to see it, unless when passing very near. Nevertheless, several rocks of the flat have over them not more than from 5 to 15 feet of water, with 8, 10, and 12 fathoms at their base. After two hours flood, and only at half a mile off, with the sea smooth, no trace of them will be seen. This reef, which lies 0° 1′ 30″ east of St. Luiz, off Maranham, is more than half a mile from north to south, and about three miles in an E. by S. and W. by N. direction. Should a vessel strike upon it she would, most probably, go down immediately.*

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* On the 21st of May, 1814, the ship Venus, of Liverpool, unfortunately experienced this misfortune, and disappeared in about 15 minutes: the utmost precaution therefore is necessary.

By anchoring for 30 hours, near the edge of the shoal, Roussin found that the tide set regularly 6 hours each day; the flood to the S. W., and the ebb to the N. E., nearly with the same strength—six-tenths of a mile an hour. High water, at full and change, at 5h. The rise and fall was 12 feet.

Captain G. Cheveley examined this shoal on the 8th of December, 1828, during a fine steady breeze, nearly east, and clear weather, and says, "The appearance of the reef, on approaching, is only that of a heavy sea or rollers, hardly breaking in calm weather, and consequently the more dangerous. It is very steep, rugged, and composed chiefly of detached coral rocks. The shoalest part appears to have about 6 feet of water over it, the sea breaking as it were through gaps, or little channels, under water. The extent seemed to be about 1½ mile from east to west, and from half to three-quarters of a mile north and south."

Vigia. Baron Roussin says, that, in 1825, he was apprised of the existence of a group of rocks, said to have been discovered by M. da Sylva, an officer of the Brazilian Marine, and he enters largely into the question whether these may not be those of Manoel Luiz. The position assigned to the Vigia, of M. da Sylva, is 0° 32′, S. and 44° 17′ W., and it consequently lies, according to this account, 7 leagues to the northward of that of Manoel Luiz.

THE EASTERN COAST. Resuming our direction at Cape St. Roque, we proceed to describe the eastern coast of Brazil towards Rio Janeiro. Cape St. Roque, as before stated, is the N. E. extremity of Brazil, and is readily distinguished by its red cliffs, from which it derives its name.

The appearance of the eastern coast of Brazil, between Cape St. Roque and the isle of St. Catherine, varies considerably. In the southern parallels, from the isle of St. Catherine to nearly 60 leagues to the northward of Cape Frio, the lands are very high and woody, and, in clear weather, may be seen 18 leagues off. On coming in from sea the coast may be safely approached, with the ordinary precautions; but this is not the case in other parts. Further to the north the land declines in height, and can be seen at a moderate distance only: it must therefore be approached with caution.

The warnings, which may be acquired by soundings, in the proximity of land to which you may be approaching, depend on the part you may be on. These warnings may be of little service on the eastern coast, particularly between the isle of St. Catherine and Olinda, as the bank of soundings extends to no long distance, and great depths prevail on its outer edges,—the parallel of the Abrolhos rocks excepted. Between the parallels of 21° and 22° S. the depths vary from 40 to 17 fathoms, 12 leagues from shore; at 30 leagues, east from Cape St. Thome, there are more than 100 fathoms. Soundings extend more to the East and S. E. of the Abrolhos, though but little to the eastward of the meridian of 37° 10′, which is 27 leagues to the east of these islets; and, beyond this, there is shortly no ground at 190 fathoms.

At only 8 leagues to the S. E. of Cape St. Antonio, off Bahia, no bottom is found at 180 fathoms; but south of this cape, at 9 miles distant, there are 28 fathoms of water. Again, at 9 leagues, on the Morro, off St. Paulo, with the Morro in sight to the west, there is no bottom at the depth of 50 fathoms.

From Bahia to Olinda the bank is generally steep; at 9 leagues to the east of the tower of Garcia da Vila the depth is not less than 160 fathoms; at the same distance to the east of the inlet Itapicuru the depth is 180 fathoms; it exceeds 170 fathoms at 20 leagues from Rio Real and Rio Sergipe, and it is found to be nearly 50 fathoms, at 10 leagues to the eastward of the mouth of the Rio S. Francisco. Finally, on all the coast, nearly to Pernambuco, there is found not less than 30 fathoms, at 9 leagues from shore; and, at less than double this distance, on the parallels of Pernambuco and Olinda, there is not a depth of less than 110 fathoms. To the northward of the parallel of Olinda the depth comparatively lessens, but, it is again very great, at a little distance from the land. Hence, it appears, that on a great part of the line of coast, between the isle of St. Catherine and Cape St. Roque, the depths are, in general, either too great or too uniform to serve as a guidance, or to suffice for correcting an estimation of the route to any particular spot. But it is not to be understood that it is useless to sound on the coast, only observing that too much dependance should not be placed on the soundings, at any distance from shore.

NATAL. This city is situated on the S. E. bank of the Rio Grande do Norte, or Indian Pontangi, a rapid river in the rainy season, but in the dry season it is much reduced; the channel to this river is protected by the recife, both on the north and south. It appears that the ends of the two portions of the recife, forming the entrance, are nearly on a true east and west line from each other, so that the channel-way faces the north, while the reefs are nearly in the same direction. The distance between the two extremities is about two cables' length, and the depths 3¾ to 6 fathoms, the depths within, and up to the town, 4 to 6 fathoms; but there are shoal banks within the reefs, on both sides, while the mid-channel is clear. A round fort, called the Fort dos Reyo Magos, stands on the middle of the southern reef, at the entrance; it is insulated at high water, but may be seen several miles off, and is the best mark. To enter the river, keep a fort on the main land, within the entrance, open of the extremity of the southern reef, until the round fort on that is seen from the W. ¾ S., and steer for it; when within two-thirds of a cable from it, proceed toward a white house, on the same side, and then directly for the town, in mid-channel, keeping over to the eastern shore, as there is a shoal bank all the way up on the opposite side. The town is about 2½ miles from the entrance, and there the breadth of the river is three-tenths of a mile, with an increasing depth of water.

To the southward of the Rio Grande is the Ponta Negra, distant 6 leagues. Several miles to the north of this are some red cliffs, called by the pilots, the Barriers of Hell, (Barriers de Infierno) and which extend in the direction of north, at some distance from shore; a rivulet falls at the foot of them, through an opening in the recife, before which breakers extend to about a mile. Bahia Fermosa, or Fair Bay, is nearly two leagues in extent, from north to south, and has, in the middle, 4 fathoms at low water; but having much foul ground, patches of coral, with some rocks, and open to the sea, it is not safe anchorage. The Ponta da Pipa, between Bahia Fermosa and Ponta Negra, is a rock on the point of land, upon which the sea breaks. To the N. W. of it are two villages.

Nine leagues to the southward of Bahia Fermosa is Bahia Traizao, or Treason bay; it has been, heretofore, described as the best anchorage on this part of the coast; but it is only a small cove, and offers no shelter against winds from between north and south by the east. To the northward of the Bahia Traizao the coast presents a continuous line of downs of white sand, covered, at intervals, with bushes. To the southward of the Bahia Traizao is the little river of Mananguape, distant 3 miles; between are several small reddish cliffs. The river is navigable by the coasters only; its south point is of sand, woody, very low, and it projects to the N. by E., terminating in breakers, on the north side of which is the entrance.

RIO PARAHYBA. This river may easily be found by making Cape Branco, which lies 10 miles to the southward. This cape is a projecting headland, having a steep cliffy shore, of white sand. Two remarkable cocoa-nut trees mark the extremity of the cape. From off Cape Branco the country, to the N. W., appears like two plains, which, on approaching, become distinctly marked. The outer one, by the sea, is low and sandy, but woody in the higher part. The river Parahyba flows between the two plains, and its direction is S. S. W. from its mouth. The south point of the mouth of the Parahyba is low, sandy, and woody, and forms the extremity of the first plain, before noticed; the barrier reef extends in front of this plain, at the distance of nearly half a mile. The north point is formed, on the second plain, by a more elevated coast, and on it are some cocoa-nut trees. On the height to the N. W. is the conspicuous convent of Nossa Senhora de Guia. Extensive breakers indicate the mouth of the river, in front of which, at the distance of three miles, there are 10 fathoms of water. Of the points which form the outer entrance of the river, that on the south is called Ponta Balea, and that on the north Ponta Lucena; these points bear from each other N. N. W. and S. S. E., 3½ miles. On the shore, within Ponta Balea, is Cabedello fort, which may be seen from the offing, and it serves as a point of recognition for the low and even coast, which is destitute of other buildings. The bar is shoal and dangerous, and its best water, at low tide, is 2½ fathoms. Vessels of 150 to 200 tons cannot proceed much above Cabedello fort, but small vessels go up to the town. Pilots come off and bring vessels to a roadstead off the fort, in order to be visited. The city of Parahyba is about 4 leagues from the sea, but the sinuosities of the river make the distance 6 leagues.

REMARKS *on the Harbour and River of Parahyba do Norte, by Commander the* HON. F. F. DE ROOS, R. N. "The river Parahyba do Norte, which is situated 67 miles north of Pernambuco, has an extensive commerce, and is generally visited by ships, homeward-bound from that port, to complete their cargoes; vessels drawing 16½ feet can safely enter, at the springs.

"The coast here trends north and south, and the direction of the river is S. S. W., nearly in a straight line. On the south point (Balea) of the entrance, which is low, sandy, and wooded, is built the strong fortress of Cabedello. The north point is also low, with cocoa-nut trees upon it, but immediately behind is some high wooded land, on the point of which the remarkable convent, da Guia, is distinctly seen. The barrier reef terminates abreast of the south point, when the bar commences, and continues until it reaches the extensive shoals which stretch out from Point Lucena.

"Ships approaching from the south are recommended to make Cape Branco, which is 4 leagues south of Cabedello. It is a remarkable point, with two cocoa-nut trees upon the very extremity. From the northward the latitude may be run down, when Cabedello fort will appear. It is the only fortress, for many leagues, upon the coast, which, otherwise, bears a great sameness of appearance. Ships should, on no account, venture into less than 6 fathoms water.

"A gun fired will bring off a pilot; they come in jangadoes, from the cocoa village to the south of the fort, and are considered expert and trust-worthy.

"The bar is at some distance from the land, and, as the passage is tortuous, it is not safe to enter without a pilot; on it there is 8 feet water, at low water, spring sides.

"The bottom is sand, in some spots hard. There are breakers on either hand, and the marks which are given are difficult to distinguish, and therefore not to be depended upon.

"The land-winds are not of frequent occurrence; vessels, therefore, have generally to beat out against the prevailing N. E. wind, which blows steadily. H. M. Sloop, Algerine, working out, in October, 1832, made twenty-one tacks.

"It is usual, for all ships entering, to anchor off the Port Cabedello, in order to be visited; after this they are at liberty to proceed up the river. H. M. Sloop, Algerine, was anchored with the fort bearing, by compass, S. 60° E., distant a quarter of a mile, in 5½ fathoms. Bad water, and few supplies are to be found at this place.

"A different pilot is appointed to take vessels up the river, which, as the wind is generally fair, is an operation of little difficulty or danger, and is almost always affected in one tide. The two shoalest spots are situated one just above Cabedello, and the other abreast of the entrance of the Tambia river. Going down is tedious, as ships have beating winds, but the reaches are long. The bottom throughout is soft mud.

"It is necessary to warp into the anchorage off the city, which is perfectly sheltered and secure. Indeed, the only vessel ever lost in the river was one, which, by inadvertence, grounded upon her anchor, and foundered.

"Water is to be procured by sending boats, with casks, up the rivers. That of the Tambia is celebrated for its purity. Provisions may be had in abundance, and at a very moderate rate.

"We had no opportunity of ascertaining the latitude of Cabedello, but have assumed it, after Baron Roussin, to be 6° 57′ 50″ S. The difference of longitude, measured from Cabedello to the lighthouse of Pernambuco, by three good chronometers, makes 5, 9, or 1′ 28′, 5 to the eastward, which, allowing that place to be in 34° 51′, gives the longitude of Cabedello 34° 50′, 5. The variation of the compass we observed to be 5° 14′ W. High water, on the full and change, at 5 h.; springs rise 12 feet. The land-breeze is seldom experienced here." *Nautical Magazine for* 1833, *page* 695.

Four leagues to the southward of Cape Branco is the Porto dos Francezos, which affords occasional anchorage for ships, but on bad ground. Hence, southward, the recife continues to the river Capibarami, or Goyanna river; the bar of this river lies nearly midway between Coqueiros, or Cocoa-tree point, and Ponta de Pedras Rock point. Here the outer reefs extend to nearly a league from the bar, and it is said that vessels of 40 tons may proceed as far. The points Coqueiros and Pedras are nearly on the meridian of 34° 47′, and they are the easternmost points of Brazil.

ITAMARCA. This island lies parallel to the main, nearly north and south, and is about 8 miles long; it has good water and an excellent harbour, the principal entrance to which is south of the island; here vessels of 300 tons may safely go over the bar, but you must have a fair wind for that purpose, on account of the narrowness of the channel, which is, in some places, not a musket-shot wide, and at this narrowest part is a shoal having, at low water, only 2½ fathoms over it; but, having passed this bank, your water deepens, and you may ride in perfect safety. The bar has 3 fathoms over it, with spring tides, and the rise of water is about 1½ fathoms; from the bar to the anchorage is one league. The northern bar of the island is called Barra, or entrance of Catuama, this is a shallow and difficult channel, which admits nothing larger than boats and small craft, although, in some parts, there is more than 3 fathoms at high water.

PAO AMARILLO, OR YELLOW WOOD RIVER. This little harbour is formed by a break in the recife, which here runs parallel to the shore, both to the northward and southward. There is a depth of 3 fathoms near the entrance, but, though there is room enough for vessels to anchor, it is unsafe, being between the reef and the shore, in a narrow channel, and being always necessary to have two anchors out, one on the reef, and the other on land, to prevent the ship swinging with the tide. On approaching to the Amarillo you may see, on the beach, a small battery. Vessels drawing 6 or 7 feet of water, which enter here, may proceed with high water, hence to Pernambuco, by passing within the recife and banks of Olinda.

The shore, between this place and Itamarca, is composed of woody hills, cultivated, and separated from the sea by a beach of white sand, at 2 or 3 miles from which you may find from 10 to 14 fathoms of water, bottom of sand and gravel. The coast hence southward to Olinda increases in height, and may be seen at a distance of 5 leagues.

PERNAMBUCO AND OLINDA. These are places of great trade. It will be seen, from what has already been written, as well as from an inspection of the chart, that the navigation of this whole coast of the Brazils is encumbered with, and rendered dangerous by, numerous rocky reefs; and the mariner who is coming from the northward, and bound to Pernambuco, should be particularly careful to give the point of Olinda a berth of full 3 miles, coming not into less than 10 fathoms water; for, should he approach nearer to the land, he will find his soundings extremely irregular, and the surrounding reefs in many parts steep and dangerous. About 3½ miles S. W. by S. from Olinda point lies the little bar of Pernambuco, where, on the northern extremity of the recife, or reef, stands the fort of Picao, an octagonal tower, with 7 guns; and, on the opposite side, the fort of Bruno, between which, over the bar, is 9 and 10 feet water. One mile and a quarter E. by N. from fort Picao lies the *Englishman's bank*, stretching, from north to south, three-quarters of a mile, and from east to west, about half a mile: this is rocky, composed of hard concreted stones and shells, and has over its shoalest part only two fathoms. The marks for it are a large cocoa-nut tree, distinguishable from all parts of the bay, and situated between the two highest buildings on the hill above Olinda, in one with the jetty on the beach immediately under that town, and bearing N. ½ E. The cross bearing, for the southern extremity, must be taken by compass, the Picao tower due west. Between this bank and the basin, or well, is a passage of 5 fathoms, and nearly half a mile in breadth.

Small vessels run over the bar of Picao, called also the little bar, which has 10 feet on it. The marks for it are, the two turrets of the southern angle of Fort Bruno in one. Large ships discharge and take in their cargoes in a basin, called the Poco, or Well, immediately at the head of the reef, and outside the harbour. The entrance to the latter is between some detached rocks, apparently a continuation of the reef, called the great bar. It has on it 17 feet of water, increasing to 20 within, when the vessels moor. The inner, northern, and southern sides, are formed by the gradual decrease of depth toward the shore, and are sandy.

In the offing the bottom is composed of fine white sand, but nearer the coast numerous patches of corals are interspersed, dangerous to cables. The best anchorage for men of war is, with Olinda North, and the Picao tower N. W., in 6 fathoms, as this is the only spot in the bay near the town of Pernambuco where they can lie, without the danger of parting in the space of three or four days.

The LIGHTHOUSE at the entrance of the harbour, stands about 50 yards from Fort Picao, on the point of the reef. The tower is octagonal and painted white. It stands on a rock, which is covered at one quarter flood; the lantern exhibits three lights in succession, from sunset to sunrise, of which two are brilliant and the other red: these make one complete revolution in every two minutes, and may be seen from the mast-head, in clear weather, 20 miles off.

CAPE ST. AUGUSTINE is a high rugged projection, easily known by its red cliffs, with a church and barn on its summit. It has also, on its eastern extremity, a battery mounting five guns, which is difficult to be distinguished at any considerable distance. By giving Cape St. Augustine an offing of 6 or 7 miles, when bound to Pernambuco from the southward, and steering a N. by E. course, you will soon gain a sight of the city of Olinda ahead, situated on the northern extremity of the bight which contains the HARBOUR AND ROAD OF PERNAMBUCO. The city stands, principally, on the southern declivity of a pleasant hill; and when the highest buildings are well in sight, Pernambuco will be seen to the southward of them, the site being low and sandy.

THE FOLLOWING DIRECTIONS FOR PERNAMBUCO, &c., ARE TAKEN FROM THE PILOTE DU BRAZIL OF THE BARON ROUSSIN. "The true bearing and distance of Cape St. Augustine, from the point of Olinda, is S. 17° W. (by compass S. 21° W.) distant 21 miles. Cape St. Augustine is the landfall generally made, when bound for Pernambuco, during the southern monsoon. The coast to the north of this declines half a league to the west, and forms a slender bay; at 17 miles northward from the cape is the city of Pernambuco. The middle of this coast is marked by the chapel of *Nossa Senhora do Rosario*, built on an elevation about half a league inland, and having two towers or steeples, which facilitate a knowledge of the place, on coming in from sea. The shore is low and covered with trees, nearly as far as Pernambuco; and, in coasting along shore, at from two to four miles off, there will be found from 11 to 17 fathoms of water, bottom of sand, with a mixture of broken madrepores.

"Having recognised Cape St. Augustine, you may proceed to the northward, at 2 or 3 miles from the coast, until you raise the fort Picao and lighthouse, between the N.W. and W.N.W.; then steering for the latter, it may be approached until you bring the cocoa-nut trees of Olinda, standing between the two highest buildings of the city, nearly N. by E. On this bearing, you will be at 700 or 800 toises (three-quarters of a mile) from the lighthouse, and you may anchor in 6 or 7 fathoms, bottom of sand, with shells and patches of coral; bad bottom it is true, but which it is almost impossible to avoid entirely in the road of Pernambuco.

"During the northern monsoon, the coast should be made a little to the north of Olinda point, in latitude 8° 1′ S., and longitude 34° 50′: this point, as before noticed, is bordered with a rocky shelf and breakers, extending outwards about two miles, and therefore should be passed at the distance of 3 miles, in 8 or 9 fathoms, until you bring the lighthouse and fort Picao at several degrees to the north of west; thus avoiding the English bank, (already described) over which the sea breaks in adverse weather."

The Road of Pernambuco is dangerous in such weather, as the swell is then very strong. The anchorage is on a rhomb to the west of the meridian of Olinda point, at less than half a mile from the kay or recife of Pernambuco, and there is some risk of driving on shore with a strong wind from the points between S. S. E. and E. N. E., more particularly in the adverse season or southerly monsoon, March to September, when the winds are frequently violent.

The northern monsoon is, at times, not more favourable than the other to the surety of vessels which may anchor here. Easterly winds are more frequent than those from the north, especially on the approach of new and full moons; and although, in this season, the weather is commonly fine, and the breezes weaker than those of the opposite season, it is requisite to take all precautions against accidents; and the first of these precautions is, not to anchor too near the land.

We have noticed that the bottom of the road of Pernambuco is of bad quality; in fact, this anchorage, with a cable liable to be cut, offers no security; and vessels employed here should have iron cables, for the best serving or rounding would protect the others but very imperfectly, from the effect of the great quantity of corals, madrepores, and lost anchors, interspersed over the bottom of this roadstead.

Vessels commonly moor E. N. E. and W. S. W., in order to have a long warp toward the offing, as well as to be more firmly situated, and readier for getting under-way. It is prudent to have the sails and all things so disposed as to get under-way promptly, should it be required. In the contrary case, drop an additional anchor in the evening, which you raise next morning.

Should you be obliged to remain some time in the road during the southern monsoon, it may be convenient to have two anchors ahead toward the offing, and one anchor on the poop to drop toward the W. N. W., in order to hinder the vessel's drifting during the calm which often succeeds a squall. The last anchor serves to resist the land-breeze, which, however, is rare in this season, and not strong in the road in any time of the year.

The Harbour of Pernambuco, formed on the coast by the *recife* which borders the shore, is sufficiently large and deep for receiving a certain number of vessels drawing from 10 to 12 feet of water. This port, as already noticed, is divided into two parts. The first, or exterior port, is named the *Poço* or *Well*, and is simply an anchorage, situate at the head of the reef, to the north of the harbour. Its entrance is formed by several rocks, or flats of detached madrepores, under water, and which are probably a continuation of the principal reef. This entrance is named the *Great Bar*, and on it are from 17 to 30 feet, at low water. Within it vessels moor with four fasts, the head to the offing. The ground of the Poço is of sand, and the depth decreases toward the shore. This place is open to the wind from the offing, and the sunken rocks at the entrance render it untenable during the southern monsoon.

"The harbour of Pernambuco, or port of Recife, is comprised between the kay of rock and the city, and is called Mosqueirao. It has from 2 to 3 fathoms of water, and is sheltered from the sea by the recife. In this place are from 8 to 6 feet at half-tide; but for entering they must pass over a bar of sand, on which, at low water, the depth is not more than 7 feet. This bar is defended by the forts Bruno and Picao, already noticed.

"The marks for sailing in, by the two passages leading into the port of Pernambuco, are 1st, for the Poço, or small Pyramid, built on the beach, surmounted by a cross, and called the Cruz do Patrao, in a line with the church of St. Amaro, on the continent, which is surrounded with cocoa-nut trees: these are a little way up the country, and clearly seen. The bearing of the objects in one is nearly true west; but before the leading mark is brought on, on approaching from the offing, you must avoid the English bank, by observing the precautions before mentioned. From the Poço or Well, this bank bears nearly east, less than a mile: its shallow part is indicated by breakers. Having entered, you will see all the interior of the harbour, having the lighthouse to the south; and, by proceeding S. by W.

(S. ½ W.) you gain the port of Mosqueirao. 2ndly, smaller vessels commonly take, on entering, the pass immediately to the north of the lighthouse, the direction for which is, to bring the two southern turrets of fort Bruno in one, and keeping this mark on, with 18 to 15 feet of water, until you see the western or inner edge of the recife, with fort Picao to the south, when you proceed along until you have the harbour, and having advanced to a proper distance, you make fast on the larboard side. The harbour is protected from the violence of the sea by the recife, the lower parts of which have been raised to the level of the other, like a continued kay. This natural wharf shelters vessels in the harbour from the winds in the offing, which are at times very strong; but they rarely cause damage to vessels well moored, though in a basin of small extent."

The predominant winds in this road are those of the tropic, which may be said to blow generally from S. S. E. to N. N. E., with this variation, that, from March to September, they approach more from the South (and sometimes even from S. W.) than in any other part of the year. In the latter season they prevail, almost without interruption, from E. N. E. to N. N. E.

The land-breeze, regular in the port, is very light in the road, and is rarely felt beyond the recife, where the breakers always deaden it; but it weakens or lulls the first winds coming from the offing. The strongest of these, both outside and in the port, are from ten o'clock in the morning until five in the evening, that is in all the day, during the absence of the land-breeze.

The temperature is commonly high at Pernambuco, especially during the night, and until nine or ten in the morning; then, after several moments of calm, which are very oppressive, the sea-breeze rising a little, reaches the coast and refreshes the air, until the moment of sunset. Notwithstanding its heat the climate of Pernambuco is considered as generally salubrious.

The tides are irregular in the port, probably because the rivers are affected by local circumstance, which increase or diminish the volume of water. The reflux or ebb is, however, perceptible after the sea has ceased to rise, and seems to accord with the lunar influence. The difference of level between high and low water is commonly 6 feet; but it attains 8 feet at the syzigies, and then the strength of the stream in the port is about two miles an hour. Under the latter circumstances it is high water at 4 h. 30 m., afternoon, or very nearly so. In the road the tides are always irregular, and the currents are determined by the prevailing winds at sea.

The variation of the compass near Pernambuco, in December, 1819, was 4° 48′ W., near Cape St. Augustine, 4° 30′.

Directions for Ships bound to Pernambuco. *(Nautical Magazine for 1835, page 321.)* "Ships bound to Pernambuco from the eastward should get into the latitude of the lighthouse, or 8° 4′ S., and run down in that latitude until they see the light, which is a revolving red and bright one, and may be seen at the distance of twenty miles from the mast-head, in clear weather. When approaching the coast, at night, the lead should be used; soundings will be got about the same time the land is seen from the mast-head, say in 50 fathoms, sandy bottom.

"Should a vessel fall in to the northward of the port, and not see the light, great care should be taken not to run too far in, or into less than 20 fathoms, until day-light. The town of Olinda, which is situated on an eminence, is a mark which cannot be easily mistaken. It has a beautiful appearance when approaching it from the eastward, in the morning. Indeed, it is the principal object of any notice along this part of the coast. Having got sight of Olinda, which is well known by its churches and other large buildings, the lighthouse and town of Pernambuco will next be seen a little to the southward. Get the lighthouse to bear W. N. W. and run in, in that direction; you will then avoid Olinda reef, and Englishman's bank or reef; you may anchor in 8, 7, and 6 fathoms, about one, two, or three miles from the light, but do not bring it to bear any more to the northward than N. N. W., as you will be then in a rocky bottom, and near a shoal that lies a little to the northward of the Jangada passage, and about a quarter of a mile from the reef.

"Should a stranger fall in to the northward of Pernambuco a near approach is dangerous, on account of extensive reefs that lie two or three miles from the shore: these reefs also extend as far to the northward as Itamaraca. This is not the case to the southward of the harbour, for, from the shoal that lies off the Jangada Passage, before-mentioned, to Cape St. Augustine the ground is clear, with the exception of some small patches of reef that lie closer in shore. Any more than these, and two small rocks that lie two miles to the northward of the cape, and close to the shore, are the only rocks or shoals that I am aware of on this part of the coast, except small pieces of reef or stone lying on the beach.

"*For a stranger to know when he is to the northward or southward of Pernambuco.* When to the northward the land will appear green and full of verdure, as far to the northward as Itamaraca, and no appearance of any white banks of sand. When abreast of the north end of this island three large cocoa-nut trees will be seen to the W. N. W.; Olinda may be seen from the mast-head, at the same time, to the S. W.; you will also see a white fort, six miles to the north of Olinda, called Pao Amarello. Should the wind prevent a vessel from lying along shore, on the larboard tack, stand off until midnight or morning, as the wind then is apt to blow at right angles with the shore, which will enable them to gain their port.

"Should a vessel fall in to the southward about Cape St. Augustine the land is very remarkable, having 10 or 12 cocoa-nut trees on its summit, and reddish banks of sand. There is also a large building among the cocoa-nut trees; but the most remarkable object about this part is some white cliffs, about three miles to the northward of the cape: these cliffs are ragged and craggy, appearing like clothes drying at a distance. Olinda will also be seen to the N. W. Should a vessel fall in to the southward of this cape, a large mountain will be seen, having the appearance of a saddle, and also two flat mountains, one on each side of the saddle mountain, bearing in a westerly direction. Should the weather be thick, so as the land cannot be seen far off, there is another remarkable object about 6 or 8 miles to the southward of the lighthouse, namely, a church, situated also on an eminence, called Nossa Senhora do Rosario, which has two steeples, and also a good mark for the harbour of Pernambuco."

"*To enter the harbour of Pernambuco.* There are generally pilots employed to conduct the vessels entering the port; but, should none be convenient, get the vessel under-way about two, or one and half-hours before high water (if at anchor.) Should the vessel not be drawing more than 16 or 17 feet, the small or Picao channel will be sufficient. Keep the two south turrets on fort Bruno in a line, which will lead you within 20 yards of the rock that lies to the north of the lighthouse; but this rock is steep close to, so that a vessel may luff close round it, and keep close to the reef, if the wind permits, until within a cable's length of the lower tier of shipping; then drop the larboard anchor, and await the orders of the harbour-master or pilots. The bar of Pernambuco, or the shallowest water, is a little above fort Picao, or the first gun from this fort. Vessels drawing more than 16 feet generally anchor in the Poço or Well, that is with the lighthouse bearing about S. E., distant two cable's length, where they may discharge part of their cargoes: this depends, however, on the state of the tides. Large ships discharge and load also outside the harbour, to the westward of the Englishman's bank, and about three-quarters of a mile N. E. of the lighthouse. Vessels lie moored in Pernambuco with two anchors down from the side next the town, and also two ropes or chains to the reef. Four vessels generally lie in a tier, and are sheltered by the reef, which is formed by nature, with the exception of a few stones which have been laid a little above fort Picao. The sea inside the harbour is in general smooth, except at the top of high water, spring tides, when there is not only a heavy swell, but also a strong current rushing over the reef. In this case good ropes or chains should be fastened to the reef. This only lasts about two hours at each high water, during a few days, at spring tides.

"There are several channels, or breaks in the reef, navigable on entering the harbour, and extending from the lighthouse towards Olinda. The first is close to the lighthouse, about one furlong wide. The large ship-channel is three-quarters of a mile wide, and clean ground. This channel is mostly used by ships outward-bound, as it is wide and safe for turning out. The marks for this channel are the cross, called the Cruz do Patrao, and a white gable of a house (a little to the north of S. Amaro church) in a line, which will clear the danger, on the southern side of the channel, or reef that lies to the north of the small channel. Then, again, by keeping fort Buraco open to the northward of a large building, about half a mile inland, will clear the danger or reef lying to the northward of this channel. There is also another break in the reef, or passage to the northward of this, but seldom used by large ships, as it lies out of the way of the harbour. On the north side of this there is a small rock, dry at low water. Here the sunken rocks terminate, leaving a fourth channel between this rock and Olinda, used only by coasting vessels.

"*Olinda Reef.* Leaving Pernambuco great care should be taken not to stand too near this reef, as about the outer edge there are some rocks lying at some distance outside of it. The greatest danger of coming in contact with this reef is, when leaving the harbour late in the afternoon, with the wind so as it cannot be cleared without tacking. In daylight there is little to fear, as the broken water can be seen; but, after the first tack, night may approach, so that the breakers cannot be seen, and also a strong northerly current (which is generally the case with the wind from this quarter) which in this case requires great care. The safest way in this case is to keep well to the southward. The marks for clearing this reef in the day-time are the Camona, or the highest church in Santo Antonio, open to the southward of the lighthouse, or the church with two steeples, lying a little to the north of the other, which leads a vessel still clearer of it. If at night, do not allow the light to bear any further to the southward than W. S. W. until Olinda bears N. W. by W., or W. N. W., a vessel will then be a good distance off shore.

"*Englishman's Bank, or Reef.* The centre of the bank or reef lies about E. N. E. from the lighthouse, distant 1$\frac{1}{8}$ mile. The least water I ever found on it was 13 feet, at low water spring tides, and very uneven rocky ground. To clear this reef to the northward, keep the highest church in Boa Vista open to the northward of the lighthouse. To clear it to the southward, keep the south turrets of fort Bruno shut in with the lighthouse. The marks, when on the shallowest part of it, are the lighthouse and Boa Vista church in a line, and the largest cocoa-nut tree, situated between the two highest buildings in Olinda, in a line with an old decayed church, the lowest public building in the town.

"This bank, or reef, is not so bad as represented, except to vessels with a large draught of water, for when vessels are coming out of Pernambuco it is generally high water, when there is plenty of water over it. However, when tacking in the bay at low water, the former marks must be observed, as also when coming to anchor, give it a good birth to the southward, as with strong S. E. winds a very heavy sea sets into this bay. When at anchor too far to the northward, a vessel may drive on it before she could be brought up. The sea breaks heavy on it with the wind from this quarter, in the same manner as on Olinda and other reefs to the northward of the lighthouse. On entering or coming out of the harbour with open boats, these breakers should be avoided, if possible, as accidents often occur with the boat getting amongst them.

"The pilotage in and out of (Pernambuco) this place is very expensive, although the pilots have no branch, yet it is customary for strangers to employ them, and even vessels trading to the port seldom refuse them. They are more serviceable in mooring and unmooring the vessel, than any great service they can render in coming in or going out. They have generally a good boat's crew, and some of them are very expert in diving, to clear away anything that may be foul of the anchor, a circumstance that often takes place; although there is one charge they make, that is, shifting the vessel down from the discharging berth to that of loading, which could be done without their assistance; still they force their service on you, and, under particular circumstances, a master of a vessel is induced to take them. Vessels loading a sugar cargo in Pernambuco, should not load deeper than 14½ feet, until they go outside. However, this greatly depends on the wind; for should it be from the S. E. quarter, and a good breeze, there is little danger of going over the bar, when drawing 15 or 16 feet, on the height of spring tides.

"*Remarks on leaving the Harbour.*—Vessels generally begin to unmoor at half-ebb, the tide previous to their going to sea, when they have plenty of time to get all their ropes or chains in, and the vessel winded, deck clear, &c. Should the wind be from the S. E., a good breeze, get under-way an hour before high water, keep at a proper distance from the reef, and make all sail possible; luff close round the rock that lies to the northward, off the lighthouse, and observe whether the trees on Cocoa-nut island open out to the eastward of the lighthouse; if they do, the rocks that lie to the northward of this channel will be passed to windward: then there is only Olinda reef to fear; but should the wind be so as these rocks cannot be weathered, which can easily be seen by the cocoa-nut trees not opening out to the eastward of the lighthouse, (or the shipping in the harbour) in this case, these rocks must be kept on the starboard hand, or passed to leeward, and therefore beat through the wide channel, as before directed.

"It is to be observed, that all these dangers, being to the northward of the lighthouse, are nearly in a direct line with the main reef, so that when the shipping in the harbour are open to the eastward of the lighthouse, a vessel is then clear of them to the eastward, and by having them open to the westward, the vessel may run along with safety, passing to leeward of them all; and by keeping the shipping in a line with the lighthouse, you pass on to the shallowest part of them. Should the wind be so as vessels cannot lie along the reef, warping down then becomes necessary, and before sail is made they ought to be close down to Port Picao. Masters, or rather pilots, not taking this precaution, often get to leeward, a circumstance which is often attended with danger, and sometimes proves fatal. This was the case with the brig Alcides, which was wrecked in 1832, abreast of fort Bruno.

"When ships are obliged to anchor outside, previous to their entering the port, which is generally the case, the masters usually go in with the boat, either to the King's wharf, or else alongside of a visit boat, with one mast and flag, lying inside the reef, a little above the lighthouse. The cargo is generally brought off in boats, or large launches, and attended with very little risk, as the distance is not great, and not much swell. From this advantage, and the regular sea-breeze, the wall, formed by nature, with its strong guns for mooring posts, that are proof against any accident that may occur, and the healthiness of the climate, this port may be considered one of the safest and best on the Brazil coast.

"Here it is high water, on the full and change, at half-past four. The vertical rise of spring tides is 8, and of neaps 5 feet. The highest tide is generally two days after the full and change."

CAPE ST. AUGUSTINE TO BAHIA, OR THE BAY OF ALL-SAINTS.

From Cape St. Augustine, southward, the coast continues to be fronted by the recife and other reefs, without which are gradual soundings to the distance of about 2 leagues. The Point of Meracahipe lies four leagues to the southward of Cape St. Augustine; it is low, and appears at a distance inundated. When at sea, to the eastward of this point, you will, however, see an inland ridge of high ground, extending north and south, which has a break or dip in the middle, and called Serra Sellada, or Saddle hill. This mountain stands in latitude 8° 25′ S., longitude 35° 11′ W. When just open to the southward of Cape St. Augustine this mount may be seen, bearing W. by S. (S. 75° W.) and when in a line with Point Meracahipe it bears nearly N. W. by W. (N. 59° W.) Above the point of Meracahipe is an hermitage, and between Cape St. Augustine and this point are, successively, the small hamlets of Maracay and Gallinhas. From Cape St. Augustine to Point Meracahipe, and still farther southward, the land is low-level, and covered with brushwood. The coast has a white sandy beach bordered with a reef.

Nearly off the entrance of the little river of Serenhen are the little islets of St. Aleixo, lying in latitude 8° 35′ 49″ S. The two islets in a line bear N. 60° W., *true*: between them and the land there is no passage. To the N. W. of the islets, and at several leagues inland, may be seen the Serra Sellada, already described. Captain Monteath passed the islets on the 20th of December, 1825, at the distance of three-quarters of a mile, the soundings regularly decreasing from 12 to 10 fathoms, clayey bottom.

Three leagues to the S. by W. from the islets of St. Aleixo is Port Tamandare. It is against an opening in the reef, which forms an anchorage, and is much larger than most of the openings of this nature. The depth and space are sufficient for large vessels, and it is said that it will accommodate 3 or 4 frigates: the depths are from 4 to 6 fathoms; a fort on the coast defends the entrance and interior anchorage. The roadstead of Tamandare is the best place for shelter between Pernambuco and Bahia; yet it is exposed to all winds from South to N. E. by E., and vessels are not protected from the sea by the reef, for it, in several places, is very little above the level of the water.

On the parallel of 9° S. is the Barra Grande, an inlet situate to the N. E. of Porto Calvo, which may induce a stranger to suppose that it is a fine harbour. It is therefore to be noticed that it has only 3 fathoms, with reefs to seaward, and a flat rock, covered with water. Its distinguishing mark is the high land of St. Bento, on the south side, and above it the church of St. Bento.

On the parallel of 9° 11′ S. is Porto Calvo, which is small, but will admit vessels of 120 tons, and may accommodate about six of that description. Those who are unacquainted with the place must keep the lead going, for along the coast, two miles from the land, are reefs stretching along, having an interval, which constitutes the entrance, and which has a depth of 5 and 6 fathoms; within is a depth of 3 and 4 fathoms. About 9 miles further you will reach the Rio Camaragibe, the shore is level, the beach white, and the reefs still continued 1 and 2 miles from land. On the south side of the Camaragibe, stretching along shore, is a range of bare hills, or cliffs of red sand. Near the river St. Antonio-merim (or little St. Antonio) is a range of red cliffs, half a league in length, and three small round hills, which stand on its northern side.

MACEIO, OR MACAYO, is a village situate on the western side of a wooded bluff. Here the shore trends in an east and west direction, and upon it, to the south of the village, is a small fort near the mouth of a rivulet; before it is an open roadstead, protected on the east by reefs of coral, but which are covered at high water. There is a powder-magazine on the wooded bluff, east of the town, which is white, and may be seen at four leagues off. On advancing nearer the church will be seen. The anchorage is good, in 5 fathoms, sand and clay, with the town and fort nearly in a line, and bearing N. N. W., at three-fifths of a mile.

Ponta Verde, or Green point, is the outer point, east of Maceio. It is covered with cocoa-nut trees, with breakers over its rocky extremity. When approaching from the N. E. Maceio is hidden by this point, but on rounding the reefs to the westward it comes in sight. At a mile from all this coast are found 10 fathoms of water, bottom of madrepores, and the depth appears to increase gradually to the distance of 4 to 6 leagues, where there are from 25 to 30 fathoms. In fine weather a vessel may anchor on almost any part of the bank. To the northward of Maceio, far up the country, are seen the Serras de Marambaya, a chain of mountains discernible at 15 leagues off, and are conspicuous over the adjoining land, which has no distinguishing mark. The middle of the mountain of Marabaya is in latitude 9° 25′. The village of Juragua is situated between the fort of Maceio and another fort, at the distance of a mile to the east; and nearly a mile to the southward of the last mentioned fort is a Baixo, or detached shoal, which breaks with a high southerly wind. It is high water, on the full and change, at 4 h. 30 m. Spring tides rise 8½ feet.

Remarks on the Port of Maceio, *by Commander the Hon. F. F. de Roos.* "On approaching Maceio, when at the distance of 12 or 14 miles, a small white building can clearly be made out. It is a powder-magazine, and is situated on a wooded bluff, which overlooks the town and harbour. The land may also be distinguished by a red spot on the face of the cliff about 5 miles to the S. W., and by a white chapel, with two towers, in the same direction; moreover, Mount Barriga, at a distance in the interior, may be observed. It stands alone, and is higher than the land which forms the coast, but is otherwise not remarkable.

"Maceio being the only convenient anchorage between Bahia and Pernambuco, enjoys a considerable commerce, and has an extensive communication with the interior. Many English vessels annually touch here. Supplies are to be had at a moderate rate, and excellent water can be obtained in the adjoining harbour of Paijucara, at a well near the beach.

"The port is formed by the point of the barrier reef terminating abruptly, which extends along the shore here, a sandy beach, forming the continuation of the coast for some miles to the southward. It is an open bay, but affords protection from the prevailing winds, which blow from N. N. E. to E. S. E. throughout the greater part of the year.

"The men who fish in the jangadas, or sailing rafts, which are constantly to be met with on this coast, are good pilots; but there is a regular harbour-master at the village of Jurugua, who will come off to bring ships, on their firing a gun.

"The anchorage of H. M. S. *Algerine*, was in five fathoms and a half, the end of the reef bearing S. E., and the covered wharf, or trapiche, E. 58° N., by compass. From this anchorage the sea is open from S. E. to S. W. ½ W., bottom sand and clay; a quarter of a mile in the direction of the trapiche are moorings laid down for the trading packets from Pernambuco and Bahia, which call every fortnight.

"Persons acquainted with the port generally approach it, keeping within a quarter of a mile of the reef, and in this manner rounding the point; but strangers are not recommended to do this, as the soundings are irregular, and the Baixo, with only 15 feet of water on it, is to be avoided. The safe rule is not to bring the powder-magazine to the eastward of north, till you have passed the point of the reef, you may then haul into your anchorage.

"In the nine summer-months this port may be deemed safe, but in June, July, and August, when the southerly winds prevail, it is very much exposed. No English merchant vessel has ever been wrecked here, though one brig, not long since, drove and bumped her rudder to pieces in a southerly wind. Instances of Brazilian wrecks frequently occur.

"There is an adjoining harbour (to the east) formed by the same reef, called *Paijucara*, which affords shelter to small vessels only. It is shaped like a basin, the entrance being near the centre. It is very shallow, and seldom used, as, with the wind to the northward of N. E. a vessel cannot fetch in. One corvette and two brigs of war have been built in Paijucara.

"The latitude, 9° 39′ S., is that given by Baron Roussin; the longitude 35° 40′ 10″ W., is determined by applying the difference of longitude, 2° 48′ 19″, as measured by three excellent chronometers, to the longitude of Bahia. This is assumed to be 38° 28′ 50″, which is the mean result of occulations observed by myself in the year 1823."

FURTHER REMARKS ON MACEIO, *by Captain C. R. Drinkwater, R. N.* "Maceio is a small port about one hundred miles south of Pernambuco. The land to the northward is of moderate height, abounding in red cliffs. Above the port there is a remarkable appearance resembling a road cut up the hills. This is a pretty good mark. The harbour is formed by reefs, the entrance round the southern end. H. M. Ship Doris anchored in 8 fathoms, rock; broke the anchor in heaving up three hours after. A little farther in, the bottom is clearer, as seen by the sludge. There is a constant swell setting in."

The bar of St. Miguel das Alagoas is the mouth of a small river which comes from the N. W., and on the northern border of which is the little town of Sta Anna. The bar of St. Miguel admits of none but very small vessels. The same is the case with Porto Franciz, a small anchorage at about two leagues more to the north; craft drawing six feet may enter Porto Franciz, the only point of communication from the lakes to the sea. The larger coasters stop in the exterior anchorage for receiving, by the jangadas, the merchandise of the country.

To the south-westward of Rio St. Miguel, in about 10° 2′ S., is the bar of Jiguia, which is not always navigable for the coasters, and they more frequently anchor outside, but with high tides it allows the passage of the smacks of 80 tons. On proceeding southward from Jiguia you pass the mouth of the little river Poxim, on which is the village of Conceicao; and at the distance of 4 leagues thence is the bar of Cururippe, off which, at the distance of nearly one league, is the Dom Rodrigo rock, which is probably connected to the chain of reefs; on other parts of this coast you may approach to the distance of two miles, where there is generally from 10 to 13 fathoms of water.

RIO SAN FRANCISCO. This is a broad and rapid river, but shallow at its entrance. It is subject to great inundations from September to March, and the current is so strong that it cannot be stemmed by an eight-oared barge. The entrance of the river is bordered on the south by Manguinha point, which is low, and covered with mangroves; from it heavy breakers extend seaward a mile and a half. The north point is also low, and of quicksand, without vegetation; the coast northward of it is of the same nature, and there are breakers as on the south. The passage in is between the breakers, and vessels anchor before it in order to engage a pilot, whose assistance is absolutely requisite. Small craft only can enter it, partly owing to the rapidity of the stream, and partly to the shoals at its entrance. According to the pilots the mouth of the river has a depth of 12 or 13 feet at high water.

The RIVER COTANDIBA lies on the parallel of 11° S. It has not more than 7 feet of water on the bar, but it is much frequented by the coasters. When you have brought the bar to the west, you will see Mount Aracaju several leagues to the N. W., remarkable from its form, in the direction of the coast, with an opening at its northern extremity. To the west is the high land, called the Morro do Selha, which is in the form of a cardinal's hat. The *river Vazabarris* lies south-westward from Cotandiba ten miles. In approaching from the east, or the south, you may see three small hills, called the Os Tres Irmaos, or the Three Brothers, situated three leagues to the S. W. of the entrance of the river Vazabarris. The town of Sergipe is built at the foot of these hills. The mouth of the river is bordered on the south by a long point of white sand, and is, as well as the north point, encompassed by violent breakers, which render an entrance difficult, under the most favourable circumstance; the channel has only 10 or 12 feet water.

RIO REAL. This river lies 21 miles S. S. W. from Vazabarris; seen from the offing the mouth presents nothing remarkable but the breakers on each side. Mango Sieco (the south point) is an extension of a beach of white sand, named the Prancha, or Plank of Rio Real. From sea, at about two miles off, are seen a number of huts in the environs of the bar; over the latter there are only 15 feet of water, with high tides. The swell is heavy, and the passage always dangerous, and to be attempted only by the boats and pilots of the country. A strong current sets outward from the river. All the coast extending from the Rio St. Francisco to the Rio Real is low, sandy, partly covered with bushes, and interspersed with little woody hills. Without the recife, or line of rock, the ground is generally clean, and between 2 and 10 miles off the depths are from 9 to 30 fathoms, bottom of ooze, sand, and broken madrepores.

From the bar of Rio Real to that of ITAPICURU the distance is 7 leagues: it has only 7 or 8 feet over the bar with high tide, and is much obstructed by breakers, which render an approach dangerous, no distinguishing marks being seen from the offing. On bringing it to the west the opening may be seen, between downs on the right and left, and there is a hamlet on the south side, at some distance within the entrance. The only vessels which enter are the decked boats and jangadas or rafts of the country. From the bar of Itapicuru the coast trends in a more southerly direction, beyond the parallel of 12°. Along the greater part of the coast are the reefs, and a strand of white sand.

In latitude 12° 32′ 30″ S., longitude 37° 58′ 30″ W., is the town of Garcia da Vila, the most remarkable object of this part of the coast; it is a sort of fort, on the rising land, situate among some trees, and having a signal-post; all the shore may be approached to the distance of a mile, in 11 to 14 fathoms, bottom of sandy ooze and broken madrepores or coral. The depths increase quickly, and at 10 miles off there is no bottom at 40 fathoms. From Garcia da Vila the coast trends S. W. to Itapuan point, an extent of 11 leagues. The recife or border of rocks continues all the way, and many are always above water, appearing like islets: those in particular about Point Itapuan are seen detached from the coast.

The Baron Roussin says, that on all the extent of coast between the parallels of 10° and 13°, we have found that the winds of the northern monsoon have daily variations, a knowledge of which is useful to those bound northward. During the night the land-breeze ceases, but this is seldom felt beyond the reefs. On the approach of day, however, the breeze freshens and blends with the winds of the offing, which seem attracted by the north coast toward noon; after this hour, the wind becomes more easterly, so as to make an angle of about two points of the compass between that of the morning and that of the evening. It follows that the borders are affected by these varieties, of which advantage may be taken.

Bahia, or Bay of All-Saints. From Point Itapuan the coast trends nearly W. S. W. 11 miles, to Cape St. Antonio, at the entrance of Bahia, or the Bay of All-Saints; upon its extremity stands the fort and light tower of St. Antonio. The light is elevated about 120 feet above the level of the sea, but it is too weak to be seen at more than 4 or 5 leagues off. By day on bringing it to the west, Fort St. Antonio appears to be separated from the land, by a small interval. At 2½ miles east, several degrees south, from the light tower, is another point, on which is a look-out and signal station; this point is the southernmost of the promontory of Bahia, and it forms, with that called *Itapuanzinho*, at a mile more to the east, a small bay, or cove, occupied by an armacçao, and defended by the rocks. Some habitations are remarkable on the coast about the cape, but landing is difficult. Here the recife or border of reefs terminates.

The entrance of Bahia, or Bay of All-Saints, is formed, on the west, by the island of Itaporica, and on the east by the peninsula, on which stands the city of St. Salvador, or of Bahia, within it the land forms an extensive gulf, or inland sea, bearing the name of *Reconcavo*. The entrance of the bay is 7 miles broad, and the gulf within about 32 leagues in circumference. The narrowest part of the principal entrance to Bahia is 4½ miles broad, but about half this space, on the eastern side, is navigable for large vessels, owing to ledges of rocks and uneven ground extending from the east and S. E. sides of Itaporica, and should not be approached to less than 8 or 9 fathoms. Without this entrance, on the eastern side, is the bank of St. Antonio, the outer extremity of which, is 4½ miles S. ½ E. from the Cape St. Antonio. It is of an irregular shape, but narrow in proportion to its breadth, and extends nearly north and south. The least depth on it is about 13 feet, at low water. As the sea occasionally breaks over some parts of it in strong winds, it is best to pass outside of the above distance in a large ship. Between the bank and the shore is a channel, having a depth of 10 fathoms, with a muddy bottom; about two miles to the eastward of the southern point of the bank the depth is regular, from 35 to 20 fathoms, and which may be carried close to it.

At the entrance of the harbour the depths are from 14 to 16 fathoms, within half a mile of the eastern shore, whence it deepens to 18 or 20 fathoms, westward, until about two-thirds across, further than which heavy ships ought not to stand. To the westward of this are overfalls, shoaling from 14 to 6½ fathoms, then deepening again to 12; and in some places, at 2½ miles from Itaporica, there are no more than 3 fathoms. On the eastern point of Itaporica the reefs extend about a mile from shore; and at about a cable's length without them the depth is 6 fathoms; it then increases quickly to 12, 18, 24, and 26 fathoms, soft muddy bottom, and in the midway over is more water; from this, in an easterly direction, the depth gradually decreases to 12 fathoms, at a mile or a mile and a half from Fort do Mar.

The Panella reef is a spot of very foul ground, about half a mile in length, from the centre of which the Fort do Mar bears E. S. E. ¾ E. three-quarters of a mile. It has, on some parts, only 3½ fathoms, at three-quarters ebb; on the other parts are 10 fathoms, rocky bottom. There is good anchorage around this shoal, between it and Fort do Mar in 7 or 8 fathoms, without it 12 or 14 fathoms, above it 8 or 9 fathoms, and below it, in the same depth, on good ground, small vessels generally lie between the city and Fort do Mar.

The best anchorage for ships of war is in 10 or 12 fathoms, with Fort do Mar bearing N. 73° E., and Montserrat fort N. 28° W., at about a mile and a half from the city. From this spot they will be able to get clear out, with the *very* light morning winds, as the ebb tides sets strongly toward Forts Cabo and St. Antonio.

The *watering-place* is at a short distance from the south end of the town, between it and Fort Gamboa; off the latter, a shoal extends along shore, and one-third of a mile outward. On this shoal H. M. Sloop *Bonne Citoyenne* grounded in 1812; is has only 10 feet over it at three cables' length from shore, hard sandy bottom. In 1841 a red buoy was placed on this shoal, in 2¼ fathoms, at low water: on entering it must be passed on the starboard.

DIRECTIONS FOR SAILING IN AND OUT OF THE BAY OF TODOS OS SANTOS, OR OF SAN SALVADOR, *commonly called* BAHIA. *(Nautical Magazine for* 1835, *page* 385.*)* "Ships destined for Bahia, during the southerly monsoon, should steer for the morro of San Paulo, in latitude 13° 21′ 53″ S. and longitude 38° 54′ 23″ W. Although this morro is of little height, it is sufficiently remarkable by being backed and followed to the northward by land lower than itself, and by having, on its northern extremity, 5 or 6 cocoa-nut trees, divided into two groups, and very distinct in comparison with the surrounding land. The hummock, which terminates this morro to the north, seen near, presents, on the side nearest the sea, large white spots, which form a striking contrast with the surrounding verdure, and which may be seen at the distance of 8 leagues, in clear weather.

"To the northward of the morro of San Paulo the coast is low, sandy, and bordered with reefs; it forms a deep bay, after which it turns to the N. E., and joins, at least in appearance, with the high island Itaporica, which forms the west side of the entrance of San Salvador.

"The separation between the west side of the island and the continent, forms what is called the false bar, or false entrance of Bahia, which is very narrow, tortuous, shallow, and cannot easily be distinguished. It will admit but very small vessels, and even the coasters do not use it, except when trading there, or when the wind will not permit them to use the principal entrance.

"From the morro of San Paulo to Cape St. Antonio the distance is 10 leagues, and the direction is N. 46° E.; in fine weather these two points are visible from each other.

"From near the morro of San Paulo a ship may steer N. E. without danger; a depth of 34 to 12 fathoms water will be found on a bottom of mud, sand, gravel, and coral, and this course will lead, at a convenient distance, between the edge of the banks to the southward of Itaporica and that of St. Antonio. A large vessel should not go to the N. W. of this line, while to the southward of Itaporica; and, if the wind blows strongly on the coast, she should keep outside until certain of being on the meridian of the Point Tabaru, the east coast of that island, which will be known by the depth being above 12 fathoms.

"If necessary to work to windward, it will be advisable to go no nearer than 5 miles to the coast of the continent, when to the southward of Itaporica, and to keep at the same distance from the island until Point Tabaru bears north. With this point bearing north, and at seven miles from it, Cape St. Antonio will bear N. 41° E. *(true)* distant 5 miles, and the south extremity of the bank, off the Cape, about a league to the eastward; and from thence a course may be shaped for the Cape until within half a mile of its shore, and then another direct for the church of Bom Fim, until abreast of the Fort do Mar, near which is the ordinary anchorage.

"Ships bound to the bay of Todos os Santos, during the northerly monsoon, should endeavour to make the land some leagues to the northward of Point Itapuan, which is on a parallel a little north of Cape St. Antonio. During the southerly monsoon they should steer for the morro of San Paulo.

"The only precaution necessary to be taken by ships from the northward, in order to avoid the bank of St. Antonio, is to give a berth of 4 or 5 miles to the Cape in rounding it, until it bears N. by E. ½ E., when they may steer for the church of Bom Fim (on the peninsula of Montserrat) until abreast of the Fort do Mar, or of San Marcello, near which is the ordinary anchorage. The depths in this course vary from 10½ fathoms (at a mile west of the bank of St. Antonio) to 18 fathoms, (at the same distance from the fort of that name;) closing afterwards the shore the depths will diminish gradually to 9 or 8 fathoms, near the Fort do Mar. If, in making this route, the wind should prove contrary, some boards may be made of 2 or 3 miles, between the bearing which joins Cape St. Antonio to the church of Bom Fim, and the banks on the S. E. coast of Itaporica; but it will be necessary to keep the lead going on both tacks, and not to go into less than 7 fathoms.

"The ordinary anchorage of ships of war is between West and S. W. of Fort do Mar, at the distance of 2 to 10 cables' length from that fort. The following bearings were taken at the anchorage, in 9 fathoms, on bottom of sand:—The Point Maguinha of Itaporica, at N. 53° W. *(true);* the port of St. Antonio, S. 19° W. *(true);* the Point Montserrat, N. 10° E. *(true.)* The great number of anchors lost in this bay renders it necessary to round the cables, and examine them frequently.

"The anchorage of merchant ships is within the line that joins Fort do Mar and the point of Montserrat. In going in the Panella rock must be avoided, which the pilots place at 160 fathoms W. by N. from Fort do Mar; and on it, they say, there is not found more than 3½ fathoms, at low water.

"The best place within the anchorage, for ships of war, is opposite the obelisk of the public garden; moor in a N. N. E. and S. S. W. direction, that of the flood and ebb tides.

"The prevailing wind is from East and S. E., with which ships may get in on one board. During the night the wind is from various points of the compass, and principally from the land side.

"The bay of Todos os Santos, considered in its whole extent, forms a deep gulf in the continent; the gulf, which bears the name of Reconcavo, is nearly 30 leagues in circuit; the sea penetrates every part of it, and it receives the waters of several rivers, of which some are considerable.

"The route for going out of Bahia is the same as that coming in. A vessel must run along the coast at half a mile to a mile distance, until she is abreast, and to the westward of, the lighthouse of Cape St. Antonio; in this track, from the Fort do Mar, from 9 to 20 fathoms will be found, and if further off a greater depth, even to 28 and 30 fathoms. Arrived at one mile west of Cape St Antonio, and steering S. S. W. 4½ miles, the shoal off the Cape will be passed in a good depth; after which a course may be shaped for the eastward."

BAHIA TO PORTO SEGURO.

About 5½ leagues to the southward of Itaporica island is the morro or headland of St. Paul, in latitude 13° 26′ S.: this is the part which former navigators were accustomed to make, when bound to Bahia, during the months of March and August, and from hence proceeding northward to the bay; but those East Indiamen who frequently have put into St. Salvador, for refreshments, have never experienced any difficulty in getting to the southward, at any season of the year, but have found the wind generally drawing well to the eastward here, and still more so as they have proceeded to the southward.

The Morro de St. Paulo appears, at a distance, like a lofty bluff ragged hill, but, as you approach it, its sides are highly cultivated, and on its summit stands an old fortification; having passed by that, the land forms a bay, the water within which is transparent, and still as a pond. The coast of the island of St. Paul is bold; the town of this island is the capital of the presidio of St. Paul (but it is a miserable one) delightfully situated. Here also are a fort and garrison.

To the N. W. of the morro of St. Paulo is the mouth of the river Una, nearly three miles broad, and forms a convenient harbour. Its western shore is low and sandy, being bordered by a sand-bank more than a mile broad on the outer part, but inward it diminishes to a point, at 2½ miles W. N. W. from the morro. On this line of direction the soundings, with clean and good ground, vary from 4½ to 5, 6, 7, and 8 fathoms, with secure anchorage, sheltered by the high lands to the eastward, the morro bearing about E. by N. a mile distant. The landing-place is half a mile within the morro, on a small bay, within which is a village protected by batteries, and having a red projecting cliff on the west. High water at 3 h. p. m.; rise 6 feet.

The low islet, Tinhare, lies without the morro, on the S. E. It is 3 cables long from W. to E., and surrounded by foul ground, with breakers extending from it, on the N. E., at 7 cables from the fort on the morro point. The coast of Boypeda island, southward of St. Paulo, is rocky and dangerous, particularly in the southern part, called the Morrera reef. Nine miles from the latter are other dangerous reefs, which extend far out from Ponta dos Castelhanos. It is advisable that vessels passing should not approach the coast hereabout, within half a degree.

Point Castlehanos is the north point of an elevated coast, whence it inclines to Ponta da Muta, a low point, off which lies the little isle, Quiepe, surrounded by rocks. This island, with the adjacent coast, form between them a small basin, distinguished by the little town of Camamee. The entrance into this is impeded by breakers, and prevent the approach of all but small vessels. The land of Camamee, to the southward of Castlehanos point, is covered with mangroves. Its termination may be known by the Pedra Branca, a white rock upon the south side of the Rio das Contas, a river accessible only by boats. From the Contas the coast trends S. ¼ W. ten leagues. All along it is perfectly clean, and large ships may proceed along it, at the distance of two miles.

St. George dos Ilheos.—This fort is situate on the south side of the bay of the same name, and appears like a part of the little town, which is the capital of the province. The Rio Ilheos is large, but divided inland into many small branches. The fort of St. George, on entering the river, may be seen on the north side. On the bar is little more than two fathoms. The north point of the entrance is a high land called Ponta de Caó, or Dog's Nose, at the base of which are some rocks, over which the sea runs in breakers. Two remarkable inlets lie off the mouth of the river, at a short distance to the east, and appear, at a distance, in the shape of cardinals' hats; one is covered with trees, and the other is bare, and frequently covered with breakers. These islands form, with the coast, a shelter for the coasters. A range of reefs extend to the southward, athwart the mouth of the river. Hence vessels, proceeding to the latter, must round the northernmost islet (Ilha Verde) off the western side of which they may anchor in 8 fathoms.

From the fort of St. George dos Ilheos, S. 4° E., distant 21 leagues, is the mouth of the Rio Grande de Porto Seguro, the entrance of which may be by the thriving town of Belmonte—a new settlement. This town is situated on the south point of the river, and is masked by heavy breakers on shore to the right and left. The river has not more than two fathoms over the bar at high water. The coast, northward of Belmonte, is straight, woody, bold-to, and may be approached with safety. At from 1 to 5 miles from shore are found from 7 to 21 fathoms of water, over a bottom of ooze and broken madrepores.

Ten leagues to the north of Belmonte are the southern boundaries of the Serras de Itaraca, a group of mountains terminating the low lands which follow Mount Pascoal, or Pascal, to the north. The southernmost of this group are the Morros de Commandatuba, where there is a small river of the same name, in latitude 15° 19′ S.

Porto Seguro lies to the southward of Belmonte, in latitude 16° 26′ 50″ S. and longitude 39° W., formed by a reef of rocks running out a mile from the main land, and in the direction of the land, forming a projection similar to a mole,—for these rocks become dry at low water, and end sharp and suddenly; between these rocks and the land is the entrance to the harbour, and over the bar, at high water, are 20 feet, but within, only 12 feet; the ground is fine sand, and forms a broad beach. Here are a number of cottages belonging to fishermen, with cocoa trees and orange grounds, the land to the northward rising to a steep hill, on the summit of which stands the town.

To the southward of Porto Seguro, distant two miles, is the chapel of Nossa Senhora da Judea. It is elevated, and its white walls, with the trees beyond it, form an excellent sea-mark; beyond the chapel is a small shallow bay called Trancosa. Farther southward is the Rio dos Frados, the mouth of which is completely choked by a bar, and there is not a single plantation on its banks. Southward from hence is the Rio Jucurucoe, on the northern banks of which stands the Villa Prado, a place considerably frequented for the article called farinha; but in the village, Alcobaca, which stands more to the southward, farinha is in greater demand.

Monte Pascoal, or *Mount Pascal*, in about latitude 16° 54′ S. and longitude 39° 23′ W., rears its circular white head, and is conspicuous to a great distance, serving as a pilot-mark in the dangerous navigation to the Rio Caravelhas, for all along the coast, hereabout, is an assemblage of rocks, islands, and sand-banks, which render the navigation very intricate and dangerous to a stranger; but the fishermen and pilots of the place conduct their vessels through the various channels with great skill and safety.

The Itacolomi is an irregular assemblage of rocks and sandy banks, extending in a north and south direction 11 miles, at a distance of 5 to 10 miles from the coast: several of them are uncovered at low water. You may navigate and anchor between them and the land from the southern extremity to one half of their length, as the northern part is connected to the shore by a bar or bank of sand, which is said to leave no passage. By keeping 13 miles from the coast you avoid all danger, and have from 10 to 20 fathoms of water; at 16 miles more to the east there are 80 fathoms. As you advance to the land, north of the parallel of Mount Pascal, you may approach it to the distance of three miles, when the depths are from 10 to 22 fathoms, on a great part of the coast to the northward.

The Abrolhos, twelve leagues from land, in latitude 17° 58′ S. and longitude about 38° 36′ W., are four islands, exclusive of several patches of rock, of which the largest is at 150 fathoms to the north of the largest and easternmost island. These islets form almost a square; the two northernmost are the highest, that to the west being 130, and the other 150 feet high. The group may be seen from the top-mast head of a frigate, at the distance of 22 miles, in clear weather. The N. W. island is called Seco, the S. W., Barbara, the S. E., Passaros, or Birds' island, and the N. E., which is the largest, perhaps half a league long, Monte dos Pedros: these islands are without either wood or water, but abound with rats and turtle.

On the west of the Abrolhos is the channel bearing the same name. It is bounded on the west by the extensive banks and reefs named the Pracel das Paredes, on which are many rocks even with, and some above, the water's edge: these banks, and the shore within them, are very imperfectly known, not having yet been properly surveyed. The extent between their northern and southern parts is a distance of 13 leagues. There is said to be within them a small channel along shore, known to the coasters only, and not to be attempted without a most experienced pilot. The eastern side of the Paredes rises abruptly from the bottom of the sea, without indicating any diminution of depth. From the edge of these banks, as well as in the middle of the Abrolhos channel, in clear weather, the opposite coast may be seen. This coast is flat and covered with trees, which, at this distance, appear as if nearly overflowed; hence, also, the Abrolhos islets may be seen.

In the Abrolhos channel the general depths are from 14 to 9 fathoms, with the exception of a few spots of 7 fathoms. The direction in which there is the most water is nearly S. S. E., and N. N. W. in passing at two miles to the west of the islets. Baron Roussin says that although this channel is 3 leagues wide, it is of little consequence to large ships; but, from an extract of a letter from a naval officer, dated at Rio, in October, 1834, says—"We sailed round the Abrolhos islands, and found the inside channel* perfectly safe. In daylight, and favourable weather, any ship may sail inside them without risk."

Mr. Wood, master of H. M. S. Tartar, in 1823, says, "The Abrolhos are low, and their vicinity should be approached with caution; but, with due attention to the lead, they may be passed with safety; and should a vessel be so situated, while attempting to pass them, either from the southward or northward, as not to be able to weather them without tacking, they will find a safe channel to the westward of them, and of some rocks just appearing above water."

Extract of a letter from Captain Fitzroy, of H. M. Sloop, Beagle, dated Rio de Janeiro, 10th April, 1832:—"On the 18th of March we sailed from Bahia, and worked our way slowly towards the eastern limits of the Abrolhos banks. The winds, being light and easterly, favoured our sounding frequently, and taking good observations.

"Having reached the parallel of the islands, to the eastward of the easternmost soundings laid down in the charts, and finding no ground with 300 fathoms of line, I began to steer westward, sounding continually, and keeping a sharp look-out at the mast-head. At two p.m., on the 26th, we had no bottom with 230 fathoms, and at four p. m. we found only 30 fathoms, without the slightest change either in the colour of the water or in its temperature, or any indication of so sudden a change in its depth.

"From that spot we had soundings in less than 40 fathoms, until we anchored near the Abrolhos islands.

"I passed to the southward and eastward of them, because that side had not been examined, but time would not allow of my doing what I wished, while so favourable an opportunity offered.

"At least a fortnight would be necessary to complete the survey of Baron Roussin, which appears, so far as we have examined, to be extremely correct. The soundings are so irregular that little dependence can be placed on the lead. It is only by a multitude of soundings, by watching the sea when there is much swell, and traversing every part with a sharp look-out at the mast-head, that the neighbourhood of the Abrolhos, particularly to the S. E., can be thoroughly examined.

"More than once we had 4 or 5 fathoms under one side of the vessel, and from 15 to 20 under the other side. The *sauts de sonde* (skips of bottom) as the French express it, are surprising.

"The tide, or rather current, which we experienced, set continually to the southward for the three days that we were near these isles, varying from half a mile to a mile and a half an hour.

"I supposed that the bottom was composed chiefly of coral rock, but was surprised to find no coral, excepting small fragments growing on the solid rock, which is chiefly gneis and sandstone. As most of the charts say '*coral rock*,' I have sent a few of the soundings for your inspection, and you will see by them that what has been here called coral is the coating of a solid rock, formed by the deposit of the sea water, mixed with coralline substances, and what a sailor generally calls barnacles.

"My meridian distance of the Abrolhos rocks from Bahia, their latitude and their size, agree precisely with those given in the French survey. But between Bahia and Rio de Janeiro, there exists a difference of from 4 to 5 miles between us; this being the only point on which I have found any such difference, either on this or on the Beagle's former voyage.

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* In H. M. Ship Doris, by adopting the channel inside the Abrolhos, in 1823, made the passage to Bahia, from Rio Janeiro, in half the time that the Conway did, by keeping well outside. The Doris sailed from Rio after the Conway, and arrived before. The Doris had smooth water and favourable weather, while the Conway had a troublesome sea and much wind.

"Having made both passages I venture to observe, that going within the Abrolhos certainly shortens that between Rio and Bahia very much; but yet I should not recommend it to any vessel, unless she has reason to make unusual haste. The soundings are very irregular, varying suddenly from 20 to 6 fathoms; and there are both reefs and currents."*

Baron Roussin has said that an oozy or muddy bottom is rarely found on the ground of the Abrolhos; the presence of ooze in the soundings bear a certain indication that you are without the shoals. He found no part without a large mixture of sand and broken madrepore, or bits of coral, and in the interior channel only; and he adds that the quality of bottom, most common round the Abrolhos, is a whitish sandstone, composed of the debris of madrepores, and of a greater or less consistence; sometimes this stone is very firm, combined of sand and rock, mostly to the N. E. of the islets. Nearer to these, from S. S. W. to N. E. by the West, the bottom consists of ground like white mortar, in which the anchor penetrates but little, though it holds fast.

At four or five leagues to the north of latitude 18° 36′ commence the soundings which announce the grounds of the Abrolhos and Paredes. In circumscribing these banks, the islets, and the shoals, in depths under 20 fathoms, an extent of 20 leagues east and west may be assigned; and it follows that a large vessel, unnecessarily, should never run to the westward of the meridian of 37° 40′, between the extreme parallels of the shoals, or 17° 30′ to 18° 15′ S., whereabout, upon the bank, a depth of from 20 to 25 fathoms may be found.

In following, from north to south, the meridian of 37° 30′, from the parallel of 17° 40′ to that of 18° 10′, the soundings skip, at certain places, from more than 100 to 24 fathoms, rocky bottom, indicating, as very probable, a still less depth; but, on a search several miles more to the east, no bottom was found with the common lead. In longitude 37° no ground at 200 fathoms.

PORTO SEGURO TO CAPE FRIO.

San Matheo. On the low shore, in latitude 18° 36′ S., is the little river San Matheo. The difficulty of the entrance, wherein there are only 4½ feet of water, in ordinary high tides, does not allow access to any but very small vessels, and the breakers, which constantly appear at the mouth, render the navigation dangerous, even to canoes. The pilots say that the river of San Matheo turns to the north above the entrance, after which it has many sinuosities. The little town of Matheo lies 7 leagues from the entrance.

To the southward of the bar of San Matheo, distant 36 leagues, is Point Tubarao on the north side of Espirito Santo. Between are the small rivers of Rio Seco, Rio Doce, Reys Magos, and Carahype, which are all unimportant to navigators; from Point Tubarao a reef of rocks extends to the distance of 700 fathoms, with this exception, you may approach any part of the coast, at two or three miles off, whether advancing from the north or the south. The depths are from 20 to 9 fathoms, bottom of sand, mixed with gravel, ooze, madrepores, and broken shells.

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* Journal of the Geographical Society, vol. II. p. 315.

Espirito Santo, or Port Victorio.—The entrance of this bay may be readily known, in approaching from the north or the south, by two conspicuous mountains, named Monte Moreno, and Mestre Alvaro.

Monte Moreno is situate on the south point of the bay. It is conical and partly woody, but devoid of verdure on the eastern side, and may be seen, in clear weather, at ten leagues off. Its bar forms, on the north, the south side of the entrance of the river of Espirito Santo. At 2½ miles to the S. E. of it are two rocks of unequal size, named the *Pacotes;* and at about a mile S. 60° W. from Mount Moreno is the *Morro of Nossa Senhora da Penha*, a rocky hill, on the summit of which is a handsome church of the same name, and which may be seen at the distance of 5 leagues. The elevation of the *Mestre Alvaro*, to the northward, its form and insulated position on a land rather low, render this mountain equally remarkable; and it is to be noticed that it succeeds the low lands of the north, and nearly terminates the high lands of the south, so as to leave no doubt, when it is in sight, as to the position of the vessel, even when the latitude is uncertain or cannot be obtained.

Two islets situate at a short distance to the N. N. W. of Monte Moreno, occupy a great part of the harbour of Espirito Santo; but although the space comprised between these isles and the hill is much obstructed by reefs and two rocks, *la Balea* and *le Cavallo*, yet there is a sufficient passage for large vessels entering the river, and that it has not less than 18 feet of water. This passage is very narrow, but the pilots say that it is the best.

The best anchorage is without the entrance, in 12 or 13 fathoms, whence the college at Victorio will be in a line with the northern base of Monte Moreno. Here you will have a bottom of ooze, good holding ground, and be a mile without all danger; and here you will be in a line of direction for proceeding upward, with the assistance of a pilot.

To the southward of the Pacotes are the islets and rocks of Jien, and at 13 miles more to the southward are the Guarapari islets, between which and the land is a passage for small vessels; and all may approach to the eastern side of them, for there is a depth of 7 fathoms. Further south, about 3 miles, are the low islets called the Razas, and farther on is the islet, Calvada, distant 4 miles from the coast. Large ships may pass within the Razas and Calvada, the depths being from 18 to 11 fathoms.

To the west of the islet Calvada, is the river Guarapari, which falls into the sea between two woody hills. The coast hereabout, and to the northward, is of moderate height, nearly covered with small trees, and having, at certain distances, low yellowish cliffs, which are not found to the southward of the point of Benevente, which is 14 miles S. W. from Guarapari, in latitude 20° 53′ 50″ S. S. W. by S., distant 5 miles from the islet Calvada, the soundings are irregular, and there is frequent occasion to haul out, in order to keep a depth of 12 fathoms; such soundings extend out about 4 miles to the S. S. W., and the water about them is discoloured. The least depth found was 6½ fathoms, and danger, if any, will show itself plainly, for the water shoalens very suddenly from 12 to 8 and 6 fathoms.

About four miles from shore, in latitude 20° 58′ S., is Francesa islet, with a reef close to it, having 7 fathoms. It stretches about a quarter of a mile from its N. E. point. Between the islet and the main the depth is not more than 3 fathoms, shoaling gradually, with a hard bottom. There is anchorage in 7 fathoms, sandy ground, with the islet N. W. by W. ½ W., three quarters of a mile. S. S. W. ½ W. from Francesa, distant six miles, is Egg islet, with reefs extending about half a cable's length from the N. E. and S. W. points. Between it and the land are 5½ fathoms, sandy bottom.

Nearly seven miles S. S. W. from Egg islet, distant five miles from shore, is a sand-bank of 4 fathoms, having 9 and 10 fathoms on each side of it, but shoaling gradually toward the land. Its length is about a mile and a half long N. and S., by one quarter broad. Off Point Murubu there is an appearance of breakers, at two miles from land. The soundings off Point Murubu are very irregular, 13 to 9 and 6 fathoms; the water thence deepens suddenly, with a hard rocky bottom; at 10 leagues S. E. from this part of the coast there are 20 to 22 fathoms, bottom of very fine white sand, but hence toward the shore on the west, and toward Cape San Thome, it gradually becomes coarser and more regular.

Cape San Thome.—From Point Murubu to Cape San Thome, in latitude 22° 2′ S., the coast is generally a low sandy beach, thickly covered with brushwood, having here and there a stunted tree. The Morley bank lies to the north-eastward of Cape San Thome; it is a rocky bank, of an oval form, and 4 leagues in diameter; the general depth of water on it is uncertain, but on one spot only three feet were found. There is a passage between it and the land.

From the *river Parahyba do Sul*, on the parallel of 21° 37′, northward, to latitude 21°, the coast gradually heightens, and has several remarkable hills inland; but in 21° the beach is not more than from 30 to 40 feet above the level of the sea. In about 21° 10′ are three remarkable red cliffs, close together, the largest being to the southward. In about 21° 28′, at some distance inland, is a remarkable sugar-loaf hill, tapering to a fine point or peak at the summit.

From the parallel of 21° to 21° 10′ the soundings are very irregular near the shore, frequently altering 3 to 4 fathoms at one cast of the lead; at six miles from land 5, 7, 10, and 13 fathoms have been found. Hereabout the great bank of soundings appears to be steep on the outside, deepening suddenly from 26 fathoms to no ground at a depth of 100 fathoms. In all the space of 9 or 10 miles over these irregular soundings the bottom is of rotten stone and coral, changing, on the outer edge, to coral and shells.

On approaching Cape San Thome the soundings are very regular, over a sandy bottom, and on nearing the shoal the ground becomes finer; a few casts of mud may be found, but the bottom, generally, is of fine sand. The eastern extremity of the shoals of San Thome, having 4¾ fathoms, appears to bear from the cape between E. and S. E., 7 or 8 miles. H. M. Ship Jaseur, Captain Martin, in November, 1825, crossed in the last-mentioned depth, and a native sumach, about a mile and a half within, from that ship, had 4 fathoms. The least water found upon this shoal was 3, 3½, and 4 fathoms.

In 4½ fathoms, and close to the breakers of Cape San Thome, the current has been found so very strong that a ship with difficulty got out again. In 3½ fathoms, to the southward, the water was so much agitated, and the current so strong over the breakers, that even a small vessel could not attempt it without danger. A ship falling in with this part of the coast, during the months of April, May, and June, may make toward the land in safety, only taking care not to enter into less than 10 fathoms, when off the cape, as it is probable that there will be a current setting south-eastward, at about two-thirds of a mile in the hour.*

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* "On the 29th November, 1834, His Imperial Majesty's frigate 'Principe Imperial,' steering S. W. by S., in the latitude of Cape San Thome, and longitude 40° 30′ W., sounded at 3 A. M., in 32 fathoms; at 3 h. 15 m., in nine; and 3 h. 20 m., in six, and half five. The ship running between five and six knots, a dark squally morning, with all sail set. No time was lost in shortening sail, and the small-bower anchor cut adrift, when we found ourselves in half four,

ST. ANNE'S BAY is formed between Cape San Thome and Cape Busios, and is deep and spacious; in rough weather the surf is violent, and the broken water runs up a long inclined plane. Within the bay, at the distance of 15 leagues from Cape San Thome, are three islets, named the isles of St. Anne: these, seen from S. S. W. and N. N. E., appear united. The southern isle is the highest, and the lowest is to the east. Between them and the main channel is so safe that you may here repair any damage, and careen the vessel, if required. The depth, to the southward of the isles, at 4 or 5 miles from the land, is from 17 to 27 fathoms, oozy bottom. Off the N. E. part of St. Anne's island are several barren rocks; on the N. W. side of the isles is anchorage, in 7 and 8 fathoms, well sheltered from Easterly and S. E. winds, but exposed to the S. W. and N. E., but with the latter there is seldom much swell. The proper route to this anchorage is by the S. W., through a clear passage, with 10 and 12 fathoms close to the islets, near which is the deepest water.

To the southward of St. Anne's bay the shore is covered with shingles, and when it meets the high rocks beyond the river Una, in the S. W. part of the bay, the shore is bold, stretches to the eastward, and forms the point of Busios. Armacao, or Armazem, is the small secure bay near the mouth of the Una; it affords refuge to vessels baffled in their attempts to double the cape, and when the wind blows hard from the east. The entrance is between two small rocky islands, called the Beautiful and the Ugly; the anchorage lies south-east of the entrance. The morro of St. Ioso is a conspicuous mark for the bay of St. Anne. Its situation is latitude 22° 32′ 26″ S., longitude 41° 59′ W.

From off the north end of the largest isle of St. Anne a sand-bank stretches to the S. W. and W. N. W., with 3 to 5 fathoms over it, the greatest depth being at above half-way across the passage toward the main. This, therefore, impedes the passage from the N. E., but the ship may beat out of the S. W. channel. Large vessels, attempting the latter, should carefully keep the S. W. end of the larger island to the Eastward of S. E., because the water shoalens suddenly on the S. W. side of the bank, and likewise toward a sandy beach on the larger island. The soundings are regular about St. Anne's isles, excepting on the bank which extends westerly from the north end of the larger island. This bank is steep-to on both sides, the water suddenly shoaling from 7 to 4 and 3 fathoms, bottom of mud, but, on the outside of the islands, sand only.

From the anchorage, in 7 fathoms, at three-quarters of a mile from the sandy beach on the large island, the bearings are the S. W. point of the large island South; the northern part of the same, E. ½ S.; the outer point of the S. W. island, N. N. E.; and the islet Ferro, at the entrance of Macahe river, N. W. by W. ½ W. Large ships should bring up farther to the southward, keeping the S. W. point of the large isle about S. E., one mile, where there will be found 7 or 8 fathoms, at a sufficient distance from the shoal. There can be no difficulty in gaining the anchorage at any time, only recollecting that the passage to it, from the N. E., is hardly of sufficient depth for large vessels.

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the frigate drawing 22 feet, and a heavy swell on at the time. At daybreak the shoals of San Thome, breaking very high, bore W. by S., distant one mile. At this time it cleared away, and we could see nearly 30 miles from the mast-head, but no land was to be seen.

"The following day we had excellent sights for the chronometers, near Cape Frio; consequently there is no doubt that these shoals extend upwards of 30 miles off.

"On the ship running out E. by N., at the rate of two knots, for three hours, we found the soundings very irregular, from 5 to 7 and 8 fathoms, and then lessening to 5 and 4½, sand; and we got soundings off the shoals in 26 fathoms, having run off at least 20 miles." *Nautical Magazine for* 1835, *page* 193.

San Joao de Macahe. The mouth of the river Macahe bears N. W. by W. ¼ W. from the largest St. Anne's isle, with the islet Ferro off the entrance, a barren rock, with some bushes upon it. There are two or three rocks at or about three-quarters of a mile from the islet, over which the sea breaks, but there is a passage on either side. The village of Macahe is situated between the northern bank of the river and the sea beach. Its harbour is not more than seventy yards broad at the entrance, and is unfit for vessels of more than 200 tons. If the flag be hoisted, it is a signal that the entrance is safe. In going in a vessel must steer close to the south side of the rock, and, when she comes abreast of it, should let go her anchor, with about 15 fathoms of cable; if she overshoot this berth she must put the helm hard a starboard, and run between the southern point, where there is a channel eight feet deep and two miles long, with remarkable clear water. A little to the south of the harbour, and close to the shore, lies a ledge of rocks, which must be carefully avoided.

The morro of San Joao, or S. Joam, lies in latitude 22° 32′ S., longitude 41° 59′ W., and may readily be known by its insularity on the coast, and its distance from the chain beyond it in the interior. N. ½ W. from this morro, distant 20 miles, is seen another hill, very high, surmounted with a peak, and remarkable for its leaning towards the north: this is called the Frade of Macahe; it stands in latitude 22° 12′ 2″ S.

Ancoras, or Anchor Isles. These islands lie S. by W., distant 21 miles from St. Anne's isles, and consist of two islets and a large white rock lying to the southward of the inner one, connected to it by a reef. The outer islet is 5 miles E. by S. from Cape Busios, and between the isles is a channel of 23 fathoms; the easternmost island resembles a cardinal's hat. Small vessels may pass between these islets and the land, and it is said by the pilots that the depth of water, in the passage, may allow vessels of every class to pass through. To the northward of Point Busios is Branca, or White isle; then follows a beach of sand, which ends at the morro of St. Joao, or Joam, with two or three small rivers, and the islet do Ferro, a barren rock with some bushes upon it, as before described.

Between Cape Busios and the isle Frio is Papagayos or Parrots' Bay; the bearing and distance between its extreme points are S. S. W., 14 miles. A great portion of the bay is occupied by a group of islets and rocks, which do not appear to have been accurately surveyed. About six miles to the northward of the isle Frio, and at the north end of a low sandy beach, are a small fort and flag-staff, on the south side of the entrance of a little river which falls down from the village of Papagayos.

CAPE FRIO is a high and rugged promontory, the south-western extremity of an isle bearing the same name, which forms, on its N. W. side, a convenient harbour. Frio Island is nearly three miles in length from N. E. to S. W., and one mile in breadth: this island may be seen, in clear weather, at fifteen leagues off. When bearing from the east or the west it presents two mountains, the southern is the smallest both in height and breadth. On a N. N. E. and S. S. W. bearing these mountains seem to form one mass, with a double summit like two small points; at the same time will be seen a little conical islet, at one or two cables' length to the E. S. E. of the cape.

By an official notice, dated "Rio Janeiro, 28th of July, 1836," it appears that from the night of the 12th of that month a lighthouse, called that of Cape Frio, would show a light, interrupted every two minutes by an eclipse of equal duration, instead of an ordinary fixed light, which had been previously exhibited: this light is visible, in very clear weather, at the distance of 41 miles.

PORT FRIO. This harbour is commodious, and secure against all winds, excepting N. E., but even with the latter you may be sheltered by the little isle Dos Porcos, which lies on the north side of the entrance. Port Frio is more than a mile in extent each way, and its depths are from 19 to 4 fathoms, but in the centre 12 to 16 fathoms. Its great entrance is at the east end, on the south side of an elevated islet, called Ilha dos Porcos; this entrance is about two-thirds of a mile wide, and its depths are 25 to 15 fathoms, bottom of fine sand and mud; the entrance from the S. W. is very narrow, but has a depth of 10 and 12 fathoms, and there is anchorage almost immediately within it for large vessels, in 7 to 10 fathoms; farther in is a bar, on the shoalest part of which are only 10 and 11 feet, so that this passage is only fit for small vessels. A small fort, with four guns, stands on a rocky point between two sandy coves, on the N. W. side of the harbour, and which entirely commands the principal entrance to the anchorage. A little within this fort is a village, occupied mostly by fishermen. Water may be had from wells in the coves on the North and N. W., as well as on the island, near its west end, where huts may be seen. The tide flows here, on full and change days, until 9 h.; and its vertical rise is about 4½ feet.

CAPE FRIO TO RIO JANEIRO.

Cape Frio, in latitude 23° 1′ 18″ S., and longitude 41° 57′ 30″ W., is the most remarkable head-land, as well as the most important land-fall, on all this part of the coast, from off this cape to the Sugar-loaf. On the west side of the entrance to Rio Janeiro the course, by compass, is nearly west, and the distance 21 leagues. The land between is low and sandy; but, at a distance from the beach, it rises to a series of elevated and uneven mountains.

Vessels bound to Rio Janeiro, when approaching Cape Frio by night, with the wind Easterly or S. E., must be cautious not to run to the northward of the cape, such mistakes having proved fatal to many ships: this, however, can never happen while the light on the summit of the island is visible. A considerable swell sets in with E. N. E. winds, which are most prevalent.

CAPE NEGRO lies to the west of Cape Frio, distant 12 leagues; it is covered with a dark verdure, and may be readily known; being steep-to, it may be approached with safety. Within three miles of it the depths are from 18 to 27 fathoms, bottom of soft ooze. Two islets, called the Maricas, lie at the distance of 13 miles S. 79° W. from Cape Negro, and 38 miles West from Cape Frio, at 3 miles from the coast; they are of moderate height, steep-to on the south side, and may be approached safely. If, on the approach of night, or under particular circumstances, a vessel cannot reach the entrance of Rio, she may advance to and anchor here. Off the western side of the islets H. M. S. Jaseur, Captain Martin, anchored in 17 fathoms, coarse sand and mud, with the rock off the southern island bearing S. E.; the passage between the isles, E. S. E.; the northern end of the isles, E. N. E. ½ E., and in a line with Cape Negro. Between the islands and the main are 13, 12, 11, and 10 fathoms, close up to the beach.

As this place is sheltered from the S. E. round by the North to W. N. W. and more West, with a fine sandy bottom, it may be considered as safe, when the wind is to the northward and eastward, or to the northward and westward. On the eastern side of the isles the sea commonly breaks with

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great violence, so that landing there is very difficult; the best place is near the N. W. end of the larger isle. In a small sandy bay, on the low part of this isle, is a well with good water, but it cannot be obtained without trouble in getting it off.

RIO JANEIRO. The mouth of the harbour of Rio Janeiro lies between two islets, *Paya* and *Maya*, to the east of it, and a bold point, surmounted by the *Gavia*, a remarkable mountain on the west. In front of it are the islets *Redonda* and *Raza*, within and westward of which are several other islets. From Paya to Gavia the bearing and distance are about W. ¾ S., 11 miles.

The islet Raza is low, and appears from the east like a slipper, with the sloping side northward. It is now distinguished by a *lighthouse*, which was first lighted on the 31st of July, 1829. The light is so elevated as to be seen nearly ten leagues off; it makes a revolution in every 3 minutes, and presents, alternately, a brilliant and a *red* light. Its situation is in latitude 23° 3′ 30″ S., and longitude 43° 4′ 45″ W. At two miles W. by S. from Raza is another isle, more elevated, appearing like a haycock, and called Redonda, or Round island.

These isles are very useful marks to vessels bound to the harbour, for a vessel bound to Rio Janeiro, should, after rounding Cape Frio, steer due west, keeping about three leagues from the coast, until she makes Redonda, and which will be descried before Raza can be seen, although the latter lies two miles more to the eastward. Currents, at times, set along the coast, either east or west, according to the winds.

The mountain La Gavia is situate about three leagues W. by S. from the entrance of Rio; its top appears to be flat, and rather larger at its summit than a little way below, which gives it the appearance of a ship's top: hence it cannot be mistaken for any other mountain, and it is the best object for distinguishing this coast; it is seen from all points of the offing between the East and S. S. W. At about N. E. by E. from the Gavia, distant 8 miles, is the Pao de Acucar, or the Sugar-loaf, a conical mountain of rock, on the western side of the entrance to Rio Janeiro. This rock has been generally considered as the beacon which serves to mark that entrance, but, it being much lower than the Gavia, it is not seen at so great a distance.

It is prudent, in general, to keep at some distance from the coast which connects Rio Janeiro with Cape Frio, because, when the wind blows from S. W. to E. S. E. by the South, the swell is incessant, and in rough weather it renders the anchorage very unsafe. You should not approach the islands, situate at the entrance of Rio, until the sea-breeze is well set in, and then you must manage to reach an anchorage before night. Without this precaution you will be exposed, by stopping among the islands, or at the entrance, during the calm which intervenes between the sea and land breezes, or encounter the latter, which directly opposes the entry, and is very often accompanied by gusts of wind, which are sometimes violent, more especially at the full and change of the moon.

If, notwithstanding all precautions, the land-breeze should set in before you have entered the harbour, and your vessel sails badly, or if the current, which almost always sets outward, will not allow you to reach the inside of the bay by tacking, it will then be more advantageous to remain outside of the islands than to anchor among them. The space for tacking is very limited, especially during the night; the ground is hard, and the swell of the sea is the stronger and more troublesome the nearer you are to the entrance. The strongest gusts of wind from the land-breezes seldom extend farther out than to Redonda, or Round island.

On ENTERING and LEAVING the HARBOUR. The passage generally preferred, on entering and leaving the harbour, is that between the isles Paya and Raza. In the channel between are from 21 to 11 fathoms, bottom of grey sand. Should you enter at a mile to the west of Raza, or midway between Raza and Redonda, you will have the western point of Paya nearly N. E., and a direct course thence N. ½ E., 7½ miles, will carry you to the west of the fortress of *Santa Cruz*, which stands on the eastern side of the entrance. On this track you leave, at a distance to the west, several islets and rocks lying to the N. by W. of Redonda, and pass about half a mile to the east of the islet *Catanduba*, or Touchinos, lying near a mile to the south of the Sugar-loaf. In this route the soundings decrease gradually from 24 to 7 fathoms, bottom of fine grey and white sand, stiff ground. There is no danger, and nothing to avoid but what may be seen.

At the entrance of Rio the least depth of water is 6½ fathoms; having passed this the depths increase rapidly; in one cast of the lead you may have from 11 to 14 fathoms, very near the battery of Santa Cruz. You may safely approach still nearer to the opposite side, but the first direction is the most followed, it having the treble advantage of leading a vessel near to the fortress, of answering the signals made therein, and of keeping clear of the little isle *Legea*, with its fort, on the opposite side of the channel. Thus, also, you will avoid the effect of current, which sometimes runs to the N. W. when the tide is rising. The passage between the fort of Santa Cruz and that of Legea is the only one frequented; that between the latter and Point S. Joao is never used, not from want of depth, but because it is narrower, and exposed to shifting winds from about the Sugar-loaf and other high lands. Here, also, the current is irregular, and the ground rocky.

From about three cables' length off from fort Santa Cruz, the direct course to the anchorage for ships of war is N. 32° W. (N. 35° W. *true*) until you are E. N. E. of the fort of Vilganhon, which you pass safely at the distance of three cables. From this spot you will steer for the Ilha dos Ratos, or Rat island, and having now arrived before the city, you may choose your anchorage in from 19 to 10 fathoms, bottom of mud; only observing not to bring the Sugar-loaf to the westward of fort Vilganhon. The best place for ships of war is to the E. N. E. of the palace, to the south of an imaginary line from Rat island to the principal church of the city, in from 14 to 18 fathoms; here you will avoid a small rocky bank, lying at 2½ cables E. N. E. of Rat island. The anchorage for merchant ships is to the N. E. and adjoining to the city, the larger ones arrive at it by passing the isle Cobras, (the fortified island to the west of Rat island) and are separated from the Men-of-war road by a shoal bank, on which the sea breaks, at low water, spring tides, when the winds from the offing are violent.

Vessels commonly moor north and south, in the bay of Rio Janeiro; but it seems preferable to moor N. E. and S. W.: this direction, being nearly that of the flood and ebb, renders it easy to lay the vessel athwart the land and sea-breezes, which are almost the only predominant winds. This will, in summer, be found necessary, for at that season the heat is, at times, almost insupportable. A hawser, carried alternately from one buoy to the other, according to the wind, will gain this advantage; the flood-anchor to be on the larboard, and that of the ebb on the starboard side.

The tides are not regular, or of equal duration, as the ebb generally runs much longer than the flood, more especially after heavy rains; the ordinary velocity of each rarely exceeds seven-tenths of a mile in the hour, but, at times it may run at the rate of a mile and three-tenths, principally during the ebb. The time of high water on the days of full and change is at three quarters past two, and the vertical rise 4½ feet, neaps only 3 feet.

On LEAVING the ROAD of Rio Janeiro the most simple precautions only are required; it will be sufficient merely to attend to the land-breeze and the ebb-tide, allowing them to carry you along; even the ebbing is not essential if the breeze has that strength which it usually acquires during certain hours daily.

To be better prepared for getting under-way, vessels frequently, on the evening before their departure, get on the side of the bay which faces the town, by which they avoid any obstruction in the Road, properly so called; and some take advantage of the strength of the land-breeze, but this is not really necessary, for a vessel may easily set out from any part of the usual anchorage.

The route for going out is the same as that for entering: passing at three cables' length to the east of the isle Vilganhon, and at the same distance on the same side of Fort Lagea, and ranging within hail of the fortress of Santa Cruz, taking care, in this tract, to keep over to the eastern side rather than the other: these are the only requisite precautions.

As you generally weigh anchor in the morning, it is probable that you will have the advantage of the land-breeze at least four hours: this will enable you to pass all the isles in the bay, and having arrived here you may tack according to circumstances. Should you experience a calm, between the land and sea breezes, before you get without the islands, it will be proper to anchor, choosing a favourable position, so as to get under-way again with the first breeze that ensues.

Captain Hewett gives the following directions for the harbour of Rio Janeiro:—"The immediate entrance of the harbour of Rio is known by two lofty peaks, one on either side; the western resembles a sugar-loaf; it bears that name, and *differs from every other on the coast* (for there are many) by the inclination of its summit to the *westward.*

"If night be too far advanced a preference ought to be given to remaining under-way, rather than to anchoring without the harbour, the ground being rocky, and much exposed to a heavy rolling swell, which increases as it approaches the bar, the shoalest water on which is but 6½ fathoms. The certainty of the sea-breeze before noon of the following day, and the tempestuous and general violence of the land-breeze, accompanied by heavy rain, &c., particularly at the full and change of the moon, render necessary the precaution of standing off and on, from and to Round island, for to it the violence of squalls seldom extends.

"The FLOOD-TIDE in the HARBOUR is of shorter duration, and of less force than the ebb, against which and a strong land-breeze our ship, the Inconstant, *turned in*, to the astonishment of the Portuguese; an effort never before attempted. After violent rains the rise of the water in the harbour has very little influence over the ebb-tide, except diminishing its strength. The ebb has been known to run a whole day without intermission; the current strongest on the western side, but an eddy flood will sometimes be visible on the eastern side, when the water is discovered to rise.

"The ENTRANCE of the HARBOUR, between the forts SANTA CRUZ and ST. JOAO is, in breadth, three-quarters of a mile. The passage between St. Joao and *Legea* or *Square island*, situated immediately in the entrance, should never be attempted, although the greatest depth of water is to be found there; the narrowness of the channel, the likelihood of the wind's becoming variable under the Sugar-loaf, the irregularity of the tide, with the rockiness of the bottom, if compelled to anchor, render it dangerous, if not impracticable. The true channel is on the eastern side of Legea island, to abreast of which, from the bar, the water gradually deepens from 6½ to 21 fathoms; and when a little past it, the ship's head being N. N. W., soundings are lost for a short time, with the common hand-line.

"Leaving the Fort do Vilganhon, (also on an island) on the left hand, the best anchorage is obtained for vessels of war, abreast the city, with the flagstaff of Vilganhon just open to the westward of the Sugar-loaf; by taking this precaution a small bank, very dangerous for cables, will be avoided. This bank is situated about 2½ cables' length from Ilha dos Ratos, or Rats' island, in an E. N. E. direction; it is circular, about a cable's length in diameter, and very rocky; the mark for 4½ fathoms, which is the shoalest water, is Ilha dos Ratos and the great church in one, and Vilganhon flagstaff on with Theodosia battery, on Point S. Joao; so that its vicinity to Ilha dos Ratos renders precaution necessary in mooring. The best bower, with a good cable, should be laid down to the westward, in order to preserve an open hawse to the entrance; a stream-cable bent on to the small bower-anchor, and taken in at the stern-port, will preserve a free circulation, both from the land and sea-breezes, and the ship's head will thus be directed to the only points of the compass from which the wind can be expected to blow fresh, and which are from N. N. W. to S. W.

"MERCHANTS' ROAD. A bar of sand, with some rocks, extend opposite to the city, the outer edge nearly in a direct line from Vilganhon to Ilha dos Ratos, and ending at the N. E. point, Ilha dos Cobras: this bar is passable for boats only, but within it all merchant-vessels, that there is room for, discharge and take in their cargoes; the only passage to it is around the north end of Cobras, near which are the arsenal and Brazilian vessels of war."

Another officer says "In entering the harbour take care to pass within hail of Fort Santa Cruz, in order to answer any questions that may be asked. There is plenty of water close to the rocks. Then proceed up to Fort do Vilganhon, below or opposite to which, bring-to, or come to anchor, and allow no boats to come alongside but those of the government, until you have received *pratique* when you will be permitted to proceed higher up the harbour, round the east end of the Isle Cobras, to the place of anchorage for merchant-ships.

"There are no pilots to be met with off the coast or harbour, for, as there is no hidden danger, they are not requisite. Whilst the sea-breeze is strong enough to enable ships to overcome the ebb, they may safely enter by night or by day; but on entering at night the fort Santa Cruz makes a signal to the city, which is not to be understood as interfering with the vessels entering.

"The port regulations require all vessels to bring-to a little below Fort do Vilganhon; and any one attempting to pass, before she has been visited, will be fired at, and the commander liable to imprisonment, besides paying a fine for each gun so fired.

"Besides the lighthouse erected on the Isle Raza, a small light is put up every night in the fort of Santa Cruz. It has been noticed that the time of high-water is at 2 h. 30 m. *p. m.*, but it seems very uncertain."

The PORT REGULATIONS of Rio Janeiro, in 1825, were as follow: "When a vessel arrives a military guard is put on board, the different government boats visit, and the custom-house boat calls alongside, to know whether the vessel is bound to Rio, or has only put in for supplies. If bound for Rio a strict search is made in the cabin and forecastle, and all parcels found are carried to the custom-house, whence they may be taken, after paying the duty. The hold is then sealed up, and the captain allowed to go on shore to enter, having previously sworn to his manifest or cargo-book, and signed a declaration in Portuguese, of his detention. If his manifest clears the vessel for Rio, she must be entered in full, and pay duty on [illegible] cargo; if for any other part, a time is allowed her to get supplies, and her hatches are not sealed. If she has a cargo to land she is sealed, and enters in *franquia*, which allows the privilege of landing and selling part of her cargo, only paying duty on the part landed.

"If, by any mistake in the interpreter, the captain declares, in the declaration in Portuguese, that he is bound for Rio, although his manifest may show that his vessel is bound to another port, there is difficulty in getting entered in *franquia*. Vessels are allowed but one discharge a day, and often are prevented from discharging, by want of room in the custom-house, or want of guards to attend to the discharge. After a lighter is loaded the hatches are immediately sealed, unless permission is previously given to the officers to remain, to allow the cargo on board to be stowed, and the vessel's hold to be put in order; for such courtesy a fee is exacted, which, if not given, much trouble and inconvenience may arise, as they are arbitrary in their office, and no redress can be had by complaining, the word of the lowest guard having more faith given to it than that of the most respectable shipmaster. Three officers are sent on board to attend to every discharge, and if one of them fails in appearing no discharge is allowed.

"Vessels cannot begin to discharge before daybreak, and the captain is bound to send his boat in time to take off the officers from the shore, or furnish another for that purpose. The expense of the guards, at each discharge, is about 4 dollars 80 cents, that is the customary fee to secure their civility—a practice of long standing, though pretended to be denounced by the judge or chief of the custom-house, and which merchants cannot avoid paying, without exposing themselves and their business to difficulty and inconvenience. All lighters, with merchandise, must be at the custom-house by seven or eight o'clock in the morning; and, as vessels lie off in the bay, small discharges only can be made at a time. Vessels loaded with dry goods are often delayed from ten to fourteen days between each discharge, without an opportunity of discharging or waiting in their turn.

"Goods, although manifested, if found in the forecastle, or anywhere out of the hold, or not under seal, are liable, by the regulations, to seizure."

DIRECTIONS FOR RIO JANEIRO, for vessels approaching from the *southward*, by the BARON ROUSSIN. "The approach to Rio Janeiro is *generally*, as we have shown, by Cape Frio, which is admitted to be correct during the northerly monsoon, and when advancing from the northward or eastward; but, under other circumstances, it will be disadvantageous, by losing time and prolonging the voyage.

"For vessels from the southward, and during the southern monsoon, the *Ilha Grande*, the *Morro of Marambaya*, and above all the *Gavia*, in the west, are the best objects of recognisance, as all these may be seen at a sufficient distance to serve as a guidance on the route, and an estimate of the distance to the anchorage.

"On advancing, another good indication is the peculiar figure of the land, between the Gavia and Sugar-loaf. When coming in from the offing, between the E. S. E. and S. W., their configuration of their summits presents, in a very remarkable manner, the figure of a man lying on his back from W. S. W. to E. N. E.; whereof the Gavia forms the head, and the Sugar-loaf the feet. When the tops of these mountains are free from clouds or mists, it is almost impossible not to be struck with this appearance.

"*The Gavia*, as already noticed, is situated at about three leagues W. by S. from the entrance to Rio Janeiro. Its summit appears flat and rather larger than the surface below it, and which gives it the appearance of a ship's top. This mountain and the Sugar-loaf, at 8 miles to the eastward of it, is described elsewhere.

"*On approaching Rio Janeiro, from the southward*, soundings may be obtained at a considerable distance from the land, but at a great depth. At 10 to 15 leagues off they vary from 60 to 80 fathoms, and diminish gradually to the coast; the bottom is a mixture of sand, gravel, broken shells, rocks, and ooze or mud."

NAUTICAL AND COMMERCIAL OBSERVATIONS ON RIO DE JANEIRO, *by the Commander of a British merchant ship.* "Running down towards Cape Frio, it is advisable to keep about 10 miles to the southward of its parallel, in order to prevent getting into the bay to the northward of that Cape; and, at night, no one must trust to see the light, at any distance, it being placed so high as, generally, to be enveloped in the thick fog, or haze, which hangs over the high land, particularly in summer. I made the land off Cape Frio, in the night, running in with the lead going. We struck soundings, and saw the land long before the light, and it was only when very close that it could be discerned twinkling through the haze; even when seen it was very much doubted whether, or not, it was a star. Many have made the same remark respecting the light, and it has been represented to the authorities. It is rather surprising, therefore, that they have not altered its position; the expense of removal, however, and the cost of re-erection are, I presume, serious obstacles with a poor government.

"Approaching the entrance of the harbour of Rio Janeiro no difficulty is met with, in ascertaining the vessels position, from the very conspicuous land in the neighbourhood of the harbour. The Sugar-loaf hill, on the left hand side of the entrance, forms the most conspicuous object, and renders the approach easy, and without danger. The regular winds in the harbour, and for several miles outside, are a land and sea breeze; the former giving place to the latter, at from 9 to 11 A. M., after this time, therefore, there is generally a fair wind for entering. After passing the Paya and Maya islands, in the entrance, two forts will be seen, one on the starboard hand in entering, called Santa Cruz, the other called Fort Sagca, situated on a small island almost immediately opposite. Passing between these two forts,—the harbour regulations require the vessel to be carried within hail of Santa Cruz, in order that the master may, in passing, give the name of the vessel, the port from whence she came, and the number of days passage.

"These questions being answered, and passing on upwards toward fort Vilganhon, situated about half-way between the entrance and the city, and on the larboard hand, it is necessary to shorten sail in time, as the vessel must be anchored previous to coming abreast of the fort, otherwise guns will be fired, for each of which the offenders must pay. While anchored here the vessel will be visited by two boats, one from the fort, the other from the custom-house, which visit being passed the master may proceed with the vessel to the customary anchorage, above the island of Cobras, (which is easily recognised, on the larboard hand, from the plan on the chart) and then anchor amongst the vessels as soon as possible, and with a short scope of cable, the holding ground being good, and no risk of driving. If the vessel has a stream-chain she will be quite safely moored with one bower and the stream-anchor, which is easily weighed.

"There are two ways of discharging cargoes in Rio Janeiro; one by putting the vessel on a list at the custom-house for her turn at the wharf, and the other by discharging in lighters, the vessel paying the lighterage. As regards dispatch, from all I could see, the former plan is the best, although far from good. Generally speaking a vessel lies in the harbour 10 days previous to being in turn; she may then be hauled alongside a small jetty at the custom-house stores, inside the island of Cobras, and, during fine weather, discharge cargo, being allowed to work, on an average, *four hours every day.* Only three vessels can discharge at the same time, the jetty only allowing this number to lay alongside. The vessel is moored here with one bower on the stream, the stream anchor on the off side quarter, and two on-shore warps; hauling off every day, after discharge, about 10 yards, and hauling in on the morning to within 3 or 4 feet of the wharf.

"No custom-house officer remains on board the vessel, neither are any places on board sealed up. A strict watch is, however, kept from several guard-vessels and boats, which latter are constantly rowing about. The shore is also well watched, and the master must be particularly careful, as the fines, imposed for contravention of the custom-laws, are enforced, and the property confiscated. While the vessel has inward cargo on board, and until she has discharged and cleared, no person, not belonging to the vessel, can come on board without a written order from the custom-house; neither can any trifling article be removed from the vessel, even for repairs, without a permit. A permit is also required for every thing taken on board,—I knew a chart to be seized, which a master was carrying openly on board his vessel, after having purchased it on shore.

"It generally occupies from 14 to 21 days to discharge a vessel of about 300 tons, after she is at the wharf, and when the cargo consists of bales and cases of manufactured goods. I have never, in any part of the world, seen a worse regulated custom-house than that at Rio Janeiro; every possible inconvenience must be submitted to by the shipmaster. He himself should carefully superintend the discharge, and the mate should be most particular in his account, comparing every day, when the discharge is finished, with the landing officer's account. Bales and cases are often said to be missing, although landed; when in the stores, even the merchant often cannot find his goods for months, and, in some instances, never succeeds in meeting with them. Peculation and robbery are openly carried on by men in the custom-house department. I brought forward evidence to prove that two bales were broken open, and part of the contents abstracted, by the marker of the goods himself, on the wharf; yet the party continued in his employment, his superiors evidently being cognizant of the robbery, and participators, no doubt, in the proceeds.

"The shipmaster, previous to leaving England, should not receive coals, iron, or lead, as ballast, if he can avoid it; they are not allowed to be discharged at the wharf, and cause infinite trouble in removing the vessel, &c. Iron, particularly, actually costs more to the vessel to land it than the freight amounts to; an officer must be got and paid, lighters must be hired, and the iron carried through the surf on the beach,—then comes the receiver declaring it damaged, &c. Crates and bale goods are the best cargo for dispatch; coals as a whole cargo are easily landed, the vessel proceeding at once to a wharf, and discharging from 25 to 30 tons per day.

"It is very seldom that return cargoes to Europe can now be procured in Rio Janeiro,—even in the coffee season, that commodity is generally shipped in foreign vessels, at low freights; their low, prime cost, and lessened expenses enabling them to carry cargoes at less freight. Every vessel ought, therefore, to have as much ballast on board, in England, as the broker will allow, or the cargo permit, as it is an expensive item in the vessel's account in Rio. Altogether this is a very expensive place for a vessel discharging a cargo: the anchorage alone amounts to 30 reis per ton, per day, for 50 days. If the vessel remains longer than 50 days there is no further payment; but if she be cleared, at the custom-house, previous to the 50 days, and afterwards detained by foul winds, or other unavoidable circumstances, the additional anchorage must be paid up to the moment of sailing, before the vessel can pass the forts. It is also said that this tonnage duty is about to be increased. For the calculation of this tonnage duty, every vessel is measured by an officer of customs, according to some rules which must be peculiar to Rio Janeiro, and suitable to the impoverished state of the finances; as measured by it, the vessel is always made to be a greater number of tons measurement than she can carry tons of dead weight. Another charge, most unjust in its principle, and illiberal in its adjustment, is a duty charged on all provisions on board the vessel, such as beef, pork, flour, bread, &c., beyond a small quantity allowed the crew, according to a scale calculated at a certain number of days from Rio Janeiro to the port for which she clears at the custom-house. The quantity allowed to each man is almost too little to keep him in existence; neither is any allowance made for a residence in the port of destination, or the homeward passage to England. Moreover, I decidedly deny the right of any foreign power to charge a duty on provisions purchased in England, and actually necessary for the supply of a vessel's crew, during her intended voyage, wherever that may be; and particularly so long as there is no trading, or intention to trade with them, in Rio Janeiro. I cannot conceive for what purpose a British consul and minister are retained at the Brazilian court, if not partly to protect British interests; yet this iniquitous overcharge on British vessels has been represented to them times out of number, and still is allowed to exist. I would advise every shipmaster to pay this overcharge under protest, lodging that protest with the consul, and I trust that this representation of the injustice of the charge will meet the eye of some one who has time and opportunity to obtain redress. Altogether the charges are high, and the detention great, in Rio Janeiro, and every one will do well to take these matters into consideration when chartering a vessel for that port.

"In chartering vessels for Rio Janeiro the brokers generally insert in the charter-party, that the vessel must be consigned to their agent, and pay the customary commission. I would recommend every one to erase both these clauses, previous to signing any charter-party, as they are unjust in their principle, and prejudicial to the vessel's interest, although the British merchants, in Rio Janeiro, are generally highly respectable; still when they are perfectly secure of consignments, the vessel's interests are not so well attended to. They always charge a commission on the whole amount of freight inwards, although the greater part of the sum is invariably paid in England, and never passes through their hands at all. This is a manifest overcharge, the only commissions they can in justice demand being on the amount of disbursements, and also the amount of freight payable in Rio Janeiro.

"Vessels calling for refreshments only, and not discharging cargo, are allowed to enter the harbour without paying port charges; and from the extent of the market, and the facility of filling water from tank-boats, I consider Rio Janeiro decidedly preferable to any port on the coast.

"No description of the beauties of the scenery, in the harbour of Rio

Janeiro, and its vicinity, has, in my opinion, done justice to their merits. In fact, I cannot think any description can convey an adequate idea of this splendid country; I have visited several parts of the world, and seen many specimens of romantic scenery, but none have at all come up to the neighbourhood of Rio Janeiro. Every visitor will be much gratified in viewing it, and, while the vessel is waiting her turn to discharge, time is afforded the shipmaster to make several excursions. Nothing can be finer than the ride to Tsucha, to the waterfalls, round the Gavia, and back to the city by the botanical gardens; the latter are well worthy a special visit. The ride alongside the aqueduct, which conveys water to the city from the Corcovada, particularly if commenced previous to sunset, affords a view, or series of views, the most magnificent that can be conceived. Every variety of scenery is seen, the city itself is spread out before and underneath you, as in a plan; on one side every variety of hill and dale, mountain and valley is perceived, covered with the most luxuriant vegetation, and studded, at intervals, with the beautiful country residences of the merchants, with the range of mountains behind towering towards the sky, on the peaks of the Corcovada and Gavia; all these objects illumined by the glowing tints of the setting sun,—amidst the fragrant odour exhaled from the immense number of vessels,—the various sail boats,—the distant mountains beyond, with their singularly rugged outline,—the entrance of the harbour, so distinctly marked by the Sugar-loaf hill,—the white fortifications, perched on the heights around,—the men-of-war just hauling down their colours, their bands saluting the departing day with their music, its strains wafted towards you by the last faint puffs of the sea-breeze, and softened by the distance, complete a picture which cannot be excelled in any part of the world." *Nautical Magazine for* 1842, *page* 803.

The following description of Rio de Janeiro, and city of St. Sebastian, from the pen of Lieut. Shillibeer, of the Royal Marines, may prove interesting:—"The city of San Sebastian, the capital of the Portuguese dominions in South America, and residence of the Emperor, is situated on the south side of an extensive harbour, whose entrance is so exceedingly narrow, and well fortified by nature, that, with the smallest assistance of art, it could be rendered impregnable against any attack from the sea. The fort of Santa Cruz, and a very remarkable mountain, from its shape, bearing the name of the Sugar-loaf, form the entrance, at the distance of about a mile. There is a bar which runs across, but the water is, at all times, sufficiently deep to allow the largest ship to pass. Santa Cruz may be considered the principal fortification, and is, with the exception of two small islands commanding the channel, the only one in a tolerable state of defence. At the foot of the Sugar-loaf mountain is a battery, of considerable extent, but so neglected, like several others along the shore, that it is almost become useless.

"The city derives but little protection from its immediate fortifications, and the island of Cobras, notwithstanding its contiguity, is now but little calculated to render it any.

"There are wharfs and stairs for the purpose of landing at, but the most convenient is at the great square, in which the Emperor resides. The palace was originally the mansion of a merchant; it is extensive, but has nothing particularly magnificent in its appearance to indicate its being the royal residence of the illustrious house of Braganza.

"At the bottom of this square is a very good fountain, which is supplied with water from the adjacent mountains, and conveyed some distance by the means of an aqueduct.

"The water is not good, and, on first using it, causes a swelling, accompanied with pain in the abdomen. Ships may be supplied with considerable expedition.

"It is almost impossible, for a person possessing the least reflection, to pass this spot without being struck with the contrast which must necessarily present itself to him. On the one hand, he may contemplate the palace of a voluptuous prince, surrounded by courtiers, and wallowing in luxury; on the other, slavery, in its most refined and horrible state.

"Leaving the square you enter a street of considerable length and width, in which the custom-house, the residence of the British consul, &c., &c., are situated.

"The houses are generally well built; some of the streets are good, and all exceedingly filthy. The shops are well supplied with British, as well as other wares; and whether the vendor be English or Portuguese, he is equally unconscionable in his demand. Most of the streets are designated by the trades which occupy them; as, in Shoe-street, you will find shoemakers; in Tin-street, tinmen; in Gold-street, goldsmiths, lapidaries, &c. Gold-street is the chief attraction, and is generally the resort of strangers, who are anxious to supply themselves with jewellery or precious stones, natural to the country; but it is not always they are fortunate enough to succeed in getting them real, for, since it has become the royal residence, it has drawn such a host of English, Irish, and Scotch adventurers, and the Portuguese being such apt scholars in knavery, that, among them, it is ten to one you are offered a piece of paste for a diamond; among the former it is but seldom otherwise. The inns, although better than in many places, can boast of no excellence.

"This city possesses a considerable number of churches, but they are by no means splendid; and, excepting in the chapel-royal, which is adjoining the palace, I observed nothing worthy of notice. Here may be seen a few good portraits of the apostles. The altar-piece is modern, and contains the full length figures of the prince and family kneeling before the holy virgin.

"The theatre and opera are attached also to the palace, but possess no particular elegance. The market is well supplied with every article, and is in so eligible a situation, that with a comparatively small portion of trouble, it might be kept in fine order: but the people are idolaters to filthiness, and not less slaves to it than superstition.

"The laws of this place seem to be very deficient; without money it is impossible to obtain justice, and with it you can prevent its being administered. The murder of a lay-subject is scarcely ever punished; the least insult to the church, most rigorously.

"The trade with this port is very considerable, and from various countries. There is a Chinese warehouse, of great extent, and, at certain periods, articles from China may be procured at a low rate. This establishment is propagating with the greatest assiduity the tea-plant, and from the progress they have already made, I am authorised in drawing a conclusion of its ultimately being of so great importance to Europe, that instead of China the Brazils will be the grand mart for this dearly beloved article.

"The country, for a considerable distance round, is peculiarly beautiful—the mountains high and woody—the valleys perfect gardens. Fruits of the most delicious nature are found here in great abundance, and the orange appears to be a never-failing tree; the quantity of this fruit I have seen exhibited for sale in the orange market is astonishing, and on the same tree is often to be seen the blossoms, the fruit in its primitive state, some half ripe, and others fit for use. The pine-apple is also here, and in great perfection. In the neighbourhood there are several botanical gardens, chiefly belonging to private individuals. Many plants, but rarely to be met with in England, were brought from them in the Briton.

"The naval department of the Portuguese is not great, but they had commissioned several sail of the line, and, before we left the port, five of them, with some frigates and corvettes, were ready for sea. Many others, of various classes, were moored off the arsenal, which is of some extent, and situated near the island of Cobras.

"The harbour of Rio de Janeiro is spacious, and, were the heat less oppressive, it might be esteemed as one of the most desirable in the world. There is a breeze from the sea, generally about noon, which cools the atmosphere, and renders it, in some degree, bearable.

"Notwithstanding the entrance is so narrow, the harbour increases to the width of three or four leagues, in which gulf, or basin, are numerous small islands, some of them possessing villages, others gentlemen's seats only. The water becomes soon shallow, so that, at a small distance above the island, containing the British hospital, it is not sufficiently deep for a vessel of any burden to pass; but great trade is carried on by means of large boats. The whole of those islands are very picturesque."

RIO JANEIRO TO THE RIVER PLATE.

MARAMBAYA ISLAND. This island lies to the westward of the entrance of Rio de Janeiro; it is twenty miles in length, and forms the Gulf of Marambaya, in which are 3 and 4 fathoms. It is bounded on one side by the main land, and on the other by the Restinga, or island; the latter is a narrow bank of sand, about twenty feet above the level of the sea; toward the sea it is steep, and the surf breaks against it with violence; toward the bay it is level and smooth. At the western end of this sandy bank is a single bold mountain, about 700 feet high. It has a church and some good springs.

Off the east end of the Praya de Marambaya is Point Guaratiba, at which commences the range of mountains that surround the Gulf of Rio Janeiro; from this point, in clear weather, at 7½ leagues to the east, may be clearly seen the Isle Redonda, off the entrance, and the steep shores, in streaks of white and dark green, which terminate the coast. You may equally see, at about 6 leagues to the E. N. E., the Gavia mountain, which, from its remarkable form, cannot be mistaken for any other, and which is the surest indication of Rio Janeiro, on approaching from the southward. On proceeding thence, toward Rio, no particular caution is required, and having come up nearly to Redonda, you may shape a course according to the wind, between it and the neighbouring islets, recollecting only, before entering, that it is requisite to have a wind which will carry you in before night; such wind commences about noon, the time of day when the breeze sets in from the offing, almost always with sufficient force.

As the land of Marambaya is low, it should, in thick weather, be approached with caution. It is the more necessary as a large or flat rock, surrounded by shoal ground, lies at 3 miles from the shore, nearly off the middle of the isle, which should not, therefore, be approached nearer than to 4 miles, or in 22 to 30 fathoms of water, bottom of sand and gravel.

The Ilha Grande is about 5 leagues in length, and separates the entrances from the harbours of Marambaya and Gairosu. The eastern end of the Ilha Grande lies at the distance of 15½ leagues from Point Garia, and opposite to the bluff point of Marambaya island; the channel between it and the latter is very safe for ships of any size, which may take shelter here; the soundings are from 15 to 9 and 7 fathoms. On the eastern side of the Ilha Grande is anchorage, in the several little bays named Palmer, Allroo, and Eschella, for ships of any burthen.

Within the Restinga, or isle of Marambaya, the soundings, eastward, diminish from 8 to 3 and 2 fathoms. From the Punta do Sena, or N. W. extremity of the isle, a reef, or tongue of sand, extends nearly three miles N. N. W., toward an islet, called the Gavia Grande, which lies at the entrance of an opening near the north shore. The best passage, toward the eastern part of the gulf, is made by keeping the main land on board, leaving the Jaguano groups on the starboard side, and the islands Sacurucu and Madiura on the larboard. There is anchorage at a mile and a half, S. E. ½ S., from the river Taguai, in 5 or 6 fathoms, muddy ground, with the island Madeira, W. N. W. ½ W., 2½ miles; Tacurucu, W. S. W. ½ W.; and Mount Marambaya, S. W.; on sailing out from this spot keep the main land on board, and pass between Tacurucu and Fatada, or the N. E. isle of the Saguana group. You may freely stand toward the Gavia Grande, but must be cautious in approaching the bank of Marambaya, proceeding in not less than 10 fathoms, as the edge of that bank is very steep. About two miles from the south side of Ilha Grande is Georgi Grego islet, which is bold-to. It affords not only anchorage, on its north side for large ships, but plenty of wood and water.

GAIROSU BAY. Between Ilha Grande and Punta Joatinga is the entrance to Gairosu bay. It may readily be known by Friar's Hood, a remarkable inland hill to the northward; bring this hill to bear N. by E. ½ E. and steer toward it, until you are 2½ miles within the point of the island, when you may anchor. By keeping within this distance from the island, on the east, a sunken rock will be avoided, which lies nearly in the middle of the entrance. On coming in numerous isles, inclosed within the bay, will be seen; and between those on the east is a passage into the gulf of Marambaya. The village of Villa Grande is on the N. E. shore. The points of Joatinga and Cairocu terminate the south part of the high lands which encompass the great bay of Ilha Grande, &c.; they are high and steep, and may be approached with safety.

S. W. by W. ½ W. from Point Cairocu, distant 25 miles, is the Porcus, or Hogs' isles. Between the larger isle and the coast is a fine channel, into which large vessels may enter and pass with perfect safety; but they should not venture in with a shifting wind. One of the best roadsteads hereabout is in a cove of Porcus, with 8 or 9 fathoms of water, sheltered from all winds, excepting those from N. E. to E. by N., which seldom continue so long as to cause a heavy sea: here the tide is scarcely perceptible. Opposite to the Ilha de Porcus is the Bahia de Tabaroes, or Shark's bay, capable of accommodating large ships, the anchorage being clear and good; its entrance is about a mile wide, with 8 fathoms water in it.

The Busios islets lie S. by E. from Ilha de Porcus, distant 11 miles, and, at 6 miles W. 31° S. is the isle Vittoria. Between these several groupes the passage is clear for vessels of all dimensions, and so is all the basin formed between the island of St. Sebastao and the continent, with the exception, that the channel between St. Sebastao and Vittoria is contracted by a reef, extending 2 miles S. S. W. from the latter, and therefore vessels of large draught should not attempt it.

ST. SEBASTAO, OR ST. SEBASTIAN. This island is 13½ miles in length, and in clear weather may be seen at the distance of 45 miles. The western coast opposite to the continent forms, with the latter, the gullet or strait, and several deep bays, wherein there are excellent anchorages, bottom of ooze or mud, and depths of 7 to 22 fathoms; vessels should enter it from the northward, and keep near the island. Its general direction, half-way down, is S. S. W. ½ W. and thence most westerly. It is contracted by a bank extending from the continental coast on the west, for more than two-thirds of its length from N. to S. In the roadsteads, on the island side, the depths are from 15 to 18, and the depths in the channel vary from 10 to 20 fathoms; the bottom muddy ground. The greatest breadth of the strait is, at the north part, 3 miles; but two-thirds of this space is occupied by the bank on the west, over which are from 5 feet to 3 fathoms.

The ancient town of St. Sebastian is on the continent, at the narrowest part of the strait. Since 1817 the Brazillians have founded a new town on the Isle, called Villa de Princeza. S. W. of this town, at the distance of 400 fathoms, is the best anchorage for ships of war, where there are 16 fathoms of water, bottom of grey sand.

The south entrance of the gullet is not above a mile wide, but during a S. E. gale it will afford shelter to ships of war. There appears to be little or no regular set or rise and fall of tide here; but the current with northerly winds set to the southward, and with southerly winds to the northward; there may however be a rise of 2 or 3 feet on the days of full and change, on which the time of high water has been estimated at 11 h.

Point Pirasmungo, the S. E. point of the island, is situate in latitude 20° 57′ 32″ S., and longitude 45° 11′ 40″ W.

Moela islet, near the entrance of the port of Santos, bears W. by S. 15½ leagues from the S. W. end of St. Sebastian. In the bay between, at 5 miles from shore, lies the Montao de Trigo, or the Corn Stack islet, in latitude 23° 51′ 4″ S., longitude 45′ 43′ 10″ W.; the Alcatrasses, or Cormorant isles, lie S. S. E. from Montao de Trigo, distant 16 miles; the largest of this groupe may be seen at the distance of 21 miles. It appears from the E. S. E. in the form of a dolphin, connected with two small rocks, which turn to W. S. W.; another rock, larger than the two just mentioned, lies at two miles to the W. N. W., and two or three others lie nearly at the same distance to the N. E.; the pilots say that the bottom, near these rocks, is not clear, and that it is dangerous to approach them within 4 or 5 miles, unless the wind be fair, as the currents from the gullet and eastern side of St. Sebastian, occasionally affect the sea hereabout, this precaution is the more requisite. From the north-easternmost of these islets the entrance of the port of Santos bears nearly west, distant 39 miles.

SANTOS. This harbour is formed, on the east, by St. Amaro island, which is separated from the continent by the river Batioga; through this river craft may still pass into the harbour. The southern, or chief entrance, to the port of Santos admits large vessels, which may enter and be sheltered from all winds, excepting those from S. S. W. to S. E. On advancing into the bay, from the southward, you will have 10, 9, 8, and 7 fathoms of water, until near the bar, upon which there are only 4½ and 5 fathoms; the passage within is narrow, but the eastern side is the boldest, having deep water close to the shore. At six miles up the river, on the eastern, and above the second bar, is a fort, upon a perpendicular rock, near which is a depth of 18 fathoms. Having arrived here you will see the town of Santos to the west, on steering toward which, at two or three cables' length from shore, you will avoid the bank stretching from the north side; and when nearly up to the town you may anchor; the best spot is abreast of the town, in 7 fathoms, muddy bottom.

The Lage or Rock of Santos, otherwise called Bird isle, is about 6 feet high above the sea: it lies 16½ miles S. 20° E. from Mocla islet; between it and Santos are 15 to 18 fathoms, sand and mud.

To the S. W. of the port of Santos is the village of Conceicao, distant 27 miles; and at seven miles E. 25° S. from Conceicao is the *Lage or Rock of Conceicao*, about 12 feet high above the sea; at a little distance from it are 12 fathoms of water, bottom of soft sand; from this place the port of Santos may be distinctly seen at seven leagues to the N. E.

Redonda, or Little Queimada. This is a small round islet, thickly wooded, and visible 20 miles off: it lies at the distance of 10 miles S. 30° W. from the Lage of Conceicao, in latitude 24° 21′ 26″ S., longitude 46° 46′ W.

The Queimada Grande is a large rock, nearly barren, lying at about 10 miles to the S. E. from Redonda, in latitude 24° 28′ 21″ S., longitude 46° 38″ W. This islet is long and narrow, extending about N. N. E. and S. S. W., nearly two miles, with a reef from its northern point. Its highest part, appearing of a round form, is to the S. W.

A rock, stated to lie in latitude 25° 41′ 20″ S., and about 44° 50′ W., was discovered on the 13th of February, 1811, by Medeiros, a pilot of Bahia, who was about a year along with Baron Roussin, and in whom Baron Roussin considered all confidence might safely be placed. If it exists, it lies about S. by E. *(true)* 35 leagues from the S. E. end of St. Sebastian.

From Concciaco the coast trends to the S. W., 14 miles, to the creek of Piruibe; thence follow, in succession, the islets and point of *Guaraha*, the little river *Una*, *Point Jurea*, the *river Iguape*, the entrance of the *Mar Pequeno de Iguape*, and the port of *Cananea*. The soundings along shore generally increase in depth according to the height of the lands; and there may be found, at from 3 to 10 miles off shore, 7 to 13 fathoms of water. You may anchor off any part of the shore, at two or three miles from the beach, on an excellent bottom, in from 5 to 9 fathoms; but as there are no harbours for large vessels, there can be no motive for anchoring here, unless in a calm, when not exposed to danger.

CANANEA. Bom Abrigo islet marks the entrance of this port; it is high, covered with trees, and vessels may anchor at a little distance from it to the eastward; a smaller islet lies on the south side of it, two miles to the eastward of which are 10 and 11 fathoms of water, over a bottom of sand. The common channel into the harbour is to the northward of Bom Abrigo, although obstructed by several shoals; but the southern channel is the deepest, and a vessel may venture into either with the assistance of a pilot. The bar may be found by means of Morro Cardoz, situate inland, about 5 leagues to the W. N. W., and by the Praya or beach of Iguape. On proceeding southward from Bom Abrigo, you will see, at the distance of 10 miles, Castillo islet, 32 feet high above the water; nearly 9 miles beyond this, in the same direction, is Figueira islet, 160 feet high; both are nearly barren, and bear from each other S. 28° W., and N. 28° W. (by compass); at a mile distant from each are 13 to 9 fathoms, fine sandy ground.

PARANAGUA. The entrance to this gulf, or bay, is sheltered and divided into two passages by the Isle do Mel, or Honey isle, which is low, and has several hummocks on it, resembling islets at a distance. To the northward of Isle do Mel are the Palmas islets. The southern passage being obstructed by breakers, is not navigable; the northern admits brigs. In entering this passage, you leave the Palmas islets on the starboard side; but here a pilot is indispensable. The town of Paranagua is on the south side of the gulf, within the west end of Colinga isle, distant 4½ leagues from the entrance.

RIVER GUARATUBA. To the S. S. W. of the Isle do Mel, distant 23 miles, is the river Guaratuba: its bar lies at the southern extremity of a shallow bank, which extends from the shore eastward, to the distance of 3 to 8 miles. On the edge of this bank, in latitude 25° 47′ S. is the Ilha do Coral, 64 feet high, and more to the southward are two islets, called the Itacolomis, 21 feet in height, lying in latitude 25° 50′ 20″ S., and longitude 48° 24′ W., these may be approached from the offing to one or two miles, where there may be found 9 to 11 fathoms of water, bottom of sand and mud.

From the river Guaratuba, distant 5⅓ leagues, is the point of Joao Dias, the northern point of the island of San Francisco, and which forms the eastern extremity of the river of that name; at 2½ miles to the east of the point, are the islets of Garcia, and south from the latter is another groupe, called the Tamboretes, distant two miles from the nearest shore. Five miles to the S. S. W. of the latter are the Remedios islets and the Lobos Tapilingo, situate off the mouth of the Aracasy, or southern branch of the Rio San Francisco; all these islets are covered with trees, and small vessels pass between them and the shore.

The river of San Francisco is the only considerable and important river hereabout; it is broad, but not deep, and falls into the sea in a N. N. E. direction. The bay before its mouth affords anchorage in several depths, and at two leagues off there are 9 fathoms of water, over a bottom of fine sand.

Between Rio San Francisco and Point Itapacoroya is a slender bay, broken only by the small river of Itapucu; in the southern part of this bay are the Itacolomi rocks, 16 feet above water, and the Faya, of 32 feet. Near the islets you may anchor, and obtain fresh water, sheltered from winds between the south and west. Between the Point Itapacoroya and the island of Santa Catherine are several bays; in the last, called Tijoucas bay, which is to the N. W. of St. Catherine, there is good anchorage.

On approaching St. Catherine's, from the northward, several small isles and islets will be seen; the largest is that named *Arvoredo*, in latitude 27° 16′ 47″ S., longitude 48° 20′ W. The channels between are perfectly safe, the depths varying from 22 to 11 fathoms, bottom of ooze and grey sand; taking care only to avoid the rock and breaker of San Pedro, which is situate at about 3,000 fathoms W. N. W. from Arvoredo. You may range along the points of land to the north-westward of these isles, named Zamba, Bombas, Garopas, and Camboriu, at the distance of 2 or 3 miles.

ISLAND OF ST. CATHERINE. This island, which forms an excellent harbour, is 9 leagues in length, and its greatest breadth is 10 miles. The northern point is in latitude 27° 22′ S., and longitude 48° 22′ 30″ W.; the entrance to the harbour is to the northward of the island, where lie several small islands; those of Alvaredo and Gal cannot easily be mistaken, particularly the latter, remarkable by the long white streaks on its steep sides, and by St. Peter's islands, which are at the south end, and two rocks at its northern extremity; the passages in are extremely good and easy. Vessels coming from the northward are recommended to steer in between the islands Gal and Alvaredo, leaving the small rocks and islands of St. Peter on the starboard side; the anchorage is perfectly safe everywhere, whether to the northward or southward of the fort Santa Cruz, which stands at the entrance; yet it is better to anchor to the southward, as well on account of communication with the town, as of the vicinity to the village of S. Miguel, where the best water is to be procured. In coming to St. Catherine's, from the southward, you steer between the island of Arvoredo and that of St. Catherine; the passage is perfectly safe. If the wind should be contrary, a ship may work in without danger, for close to St. Catherine's there are 4 fathoms of water, and the coast towards Arvoredo is equally deep.

The ebb and flood here are very unsettled, and depend entirely on the wind, the flood sets in from the north, the ebb from the south; and, as the wind is almost always from the sea, the ebb, with a fresh northerly wind, is scarcely apparent, and seldom lasts more than two or three hours.

Baron Roussin says, "That the island of St. Catherine is sufficiently elevated to be seen, in clear weather, at the distance of 15 leagues. At this distance is found 62 fathoms of water, and this depth diminishes to four cables from the coast, where there are only 4 fathoms.

"On approaching from the east the island appears in very irregular heights, being intersected by mountains separated by deep valleys; the greatest elevation is from north to south, and the mountains of the continent beyond it are a-little more elevated than that of the island. You will particularly distinguish among them the *Morro de Camborella*, a branch of the eastern *Cordilheiras*, extending from St. Catherine's to Rio Janeiro.

"About the middle of the isle, near the sea, is a large lagoon, under the high lands, which presents an apparent opening, that may serve as a landfall. When, at 3 leagues from the eastern coast, you bring this opening to the west, the N. E. point of the isle will bear about N. W., at three leagues. All the exterior coast is clean and moderately steep, and you may range along it without danger, passing several large rocks which lie off it.

"The island may be navigated all round, and it presents numerous anchorages between its western coast and the continent; but the north part of the intervening channel is the part most fit for vessels drawing much water, and it is, therefore, that generally used. This passage is rather less than two leagues broad, is clear of danger, and, on coming in, you may advance to either side, only observing to keep clear of the *Northern Moleques*, large rocks, which lie to the S. E. of Point Rapa, the north point of the island. This channel hence is clear, and you may beat up to either shore without risk, in from 40 to 28 feet of water.

"Having advanced within the strait, you may anchor in any part, according to the vessel's draught; and, in keeping near mid-channel, the depth will be sufficient for large ships when at 1,000 toises (1,065 fathoms) S. by E. from the little isle Anhatomirim, on which the fort of Santa Cruz is built. Passing this point, on advancing to the south-westward, the depth gradually decreases to 15 and 12 feet; and to the southward of the Raton islets, lying on the eastern side, there is not more than 10 or 12 feet of water. In the large bay to the west, called the Sacco Grande, the depths are still less; this bay is a tranquil place, frequented mostly by vessels employed in the whale fishery of the coast, and is well adapted for small vessels.

"The tides are regular in the gullet, but it has been remarked, that, as they enter by the north and south at the same time, meeting in the roadstead near the town, they return in a similar way, with greater or less velocity as they may be accelerated or retarded by the prevailing wind. The mean velocity of the current rarely exceeds three-tenths of a mile in the hour, at half-tide, and the difference of level, in ordinary tides, is not more than three feet. In the Syrygies, however, the current frequently runs at the rate of a mile and a half, and then the water rises and falls 5 or 6 feet. Time of high water, on the full and change, 2 h. 40 m.

"The governor of the province resides in the town of Nossa Senhora do Desterro, which is situate at about 10 miles S. by E. from the islet Anhatomirim, on the narrow of the strait, about half-way down the island. This place, which is well sheltered, may be reached at all times by small vessels, and the communications between all the points are quickly made. At the anchorage, half a mile before the town, the depth, at low water, is 20 feet.

"The approach to St. Catharine's may be made indifferently on the parallels between 27° 30′ and 28°. The winds and currents in the offing are not such as to cause much error in the route; but, at all times, you should prefer making the southern part of the isle in the southern monsoon, and that of the north on the contrary."

The coast to the southward, and the southern part of St. Catherine's, were not surveyed by Baron Roussin, and, in consequence, M. Barral, commander of the surveying vessel l'Emulation, was charged with continuing the work, and surveying the Rio Plata; the following is his description,—"The lands of the island, and of the adjacent coast to Cape Santa Maria Grande, are very high and woody. The highest mountains which are seen beyond the island are in the chain of *Cubatao;* they are covered with clouds during the prevalence of southerly winds, but are clear with winds from the N. E. In the offing, at 12 leagues from the island, there are soundings of 62 to 72 fathoms, with a muddy bottom. On approaching, the depth gradually decreases; at a distance of three leagues are 33 to 35 fathoms, and 18 to 28 at 4 miles.

"The *Isle Arvoredo*, at the northern entrance, which is high, has two sugar-loaf summits, which are first seen on approaching. The islet Badejo, 8 miles to the southward of Arvoredo, is destitute of vegetation. A vessel drawing not more than 14 feet of water, and entering by the north passage for the town of N. S. do Desterro, having passed the north end of the island, should be guided by the following indications:—

"Steer for the Cape Quebra Cabaço, on the continent, leaving the two islets, Ratons, on the larboard side, at a mile and a half or less. The course toward the island of Anhatomirim will be about S. W. by W., and thence S. W. by S. When you bring the Little or Southern Raton to bear E. ½ N. *(East)* at two miles off, change the course to S. E. and continue it thus for 3 miles, passing a rocky flat, *Impatitinga do Norte*, off Cape Quebra Cabaço, on the starboard side. On these rocks are only 4 or 5 feet, at low water. When you have brought the cape to the south of these rocks, bearing W. N. W., the route is to the S. W. until you bring the rocks N. N. W. ½ W.

You then steer to the south-westward, about half a league, so as to pass at 4 or 5 cables to the eastward of a rock near *Cape Henriques*, which, being a woody cape, is thus distinguished from Quebra Cabaço; next proceed south-eastward, toward the narrow part of the strait, leaving the islet and point *do Lial*, on the western side, at the distance of 3 or 4 cables. Steering hence S. by E. you enter the Little Strait or Narrows, which is commanded on the left by *Fort Santa Anna*, and on the right by the battery of *San Joao*. Here you will find from 11 to 16 fathoms of water, and will perceive, in advancing, the islets *Gato* and *Das Vinhas*, at the extremities of the cove on which the town is built; you leave the first on the left, and may then cast anchor in 20 to 21 feet of water, with the islet Gato bearing N. N. E.; Das Vinhas, S. S. E.; and the steeples of the cathedral, N. E. The city of N. S. do Desterro is situate in latitude 27° 35′ 25″ S., longitude 48° 29′ 16″ W.

"On coming from the northward to the town, at times, there are found spots of only 7 feet of water, but the ooze has 5 feet at least, and the vessel will not be injured; with high water the Emulation, which drew 14 feet, came up to the town in three days. When the water was low and the stream weak she anchored.

"The Eastern coast of St. Catherine's is clean, but off the points, at some distance, are several rocks and islets above water: these are the Northern Moleques, the islet Badejo, the two Aranhas, the isle Xaviar, Ilha do

Campexe, the Southern Moleques, the Tres Irmaos or Three Brothers, the Papagaios isles, the Fort isle, at the entrance of the southern passage, and the Isle dos Cardos, within the same.

"In proceeding along the coast, at the distance of 3 or 4 miles, we passed between the Irmaos and the southern Moleques, in 15 fathoms of water. The only obstructions are the islets and rocks above-mentioned, which may be seen at 9 miles off, and about which there are 13 fathoms. At the Isle do Campexe you may find anchorage, sheltered from southerly winds.

"THE SOUTHERN ENTRANCE into the Strait or Gullet of St. Catherine's lies between the S. W. extremity of the island, Point dos Naupagados, and the Fort isle, a very narrow passage, but in which there are 17 fathoms of water. In entering from the southward you should have a leading wind, rising tide, and fair weather, without which the current may carry you on the Fort isle, or on the opposite point, which are less than 300 fathoms apart. The vessel should not draw more than 15 feet. On coming from the southward you steer toward the Fort isle, and, when you have the Papagaios on your left, you will see the Irmaos to the right. On passing hence, north-westward, the pass between the Fort isle and Point Naupagados will be open; having passed through, on a west course, you change the course to north, and pass the islet Cardos, which is remarkable for an insulated tree, which stands on its summit.

"You pass to the eastward of Cardos, at the distance of one or two cables, and then proceed north-westward, toward the Enceado do Brito, to the distance of half a mile; and thence north, along the western shore, to the point of Pesqueiro Fordo, at the distance of 4 cables; thus you will leave, on the western side, the village of Enceado do Brito, and further on a cluster of houses and cottages, forming the little hamlet of Cedros. On your right, at a distance, you may see the village of Ribeirao, or San Lapa, on the island of St. Catherine, and nearly before you will be an islet, the Ilha do Largo; before arriving at the last you will have passed a flat of dangerous rocks, beyond which you will be, when the steeples of the cathedral appear on the western part of the islet Largo, and the west point of Cardos is on the fort of the south bar. From off the Isle do Largo continue your course N. ½ W., until an islet, des Cascas, bears west, thence proceed toward the steeples of the city, up to the anchorage, between the islets do Gato and dos Vinhas.

"At the distance of 2½ miles from the south end of St. Catherine's is Point Pinheira, under which is good anchorage, sheltered from southerly winds; from the outer extremity of this point, distant 2½ miles, is the Ilha do Coral islet, about three-quarters of a mile in length; it is covered with trees, and is a useful mark for vessels bound in by the southern passage. Its situation is latitude 27° 55′ 10″ S., longitude 48° 29′ 10″ W. Between this islet and the Cape St. Marto Grande are the Ilha das Araras, to the S. E. of Point Bituba, in latitude 28° 18′ 0″ S., longitude 48° 31′ 32″ W.; the islet Tocoromi, a high and steep rock, to the S. E. of the Ilha Araras, in latitude 28° 19′ 29″ S., longitude 48° 30′ 30″ W.; and the Isle dos Lobos de la Jaguna, to the S. E. of the Araras and Tocoromi, in latitude 28° 24′ 36″ S., longitude 48° 40′ W.

"At Point Bituba begins the beach, within which is a lake, and the towns of *Villa Nova*, *Santa Anna*, and *la Laguna*; the last is situate at the south part of the lake, at a mile to the N. W. of the bar, in latitude 28° 28′ 33″ S., and longitude 48° 45′ 24″ W. At la Laguna is anchorage, practicable only for small vesssels drawing under 7 or 8 feet of water, as there is a bar at the entrance.

"*The Cape Santa Marta Grande* is the final termination of the line of mountains extending within shore to the northward, and is remarkable by having on its summit several great white rocks, which, from a distance, appear like an assemblage of houses. The variation of the compass here, in November, 1831, was 7° 20′ E.

"Between Cape Santa Marta Grande and the bar of the Rio Grande de San Pedro, an extent of about 95 leagues, the coast is extremely low, and variegated only by sand-hills and stunted bushes. It can hardly be seen, in clear weather, from the mast-head, at the distance of 7 or 8 miles, and from the deck at not more than three miles; the first part, from the north, trends nearly S. W.; this part is called the Praya, or beach of *Torres*, it begins in longitude 48° 44′ 56″, and ends in 49° 55′ 52″ W. The second part trends N. by E. and S. by W., and is called the *Praya*, or *beach of Fernambuco*. Its eastern part begins with the termination of the former, in latitude 29° 52′ S., and it extends to longitude 50° 34′ 52″ W. The third part trends nearly S. W., and is known under the name of the *Praya do Destreito*, from latitude 31° 12′ S. to the mouth of the Rio Grande de San Pedro.

"When to the southward of Cape Santa Marta Grande, you may see, in running along, a chain of mountains extending westward, about 15 leagues from the sea into the interior country, and disappearing at *Torres*, which stands at 25 leagues from the cape, in latitude 29° 28′ S. The beach here may be approached to the distance of 3 or 4 miles, and was coasted, at this distance, by the *Emulation;* but there were no marks on shore fit for triangulation; the situation of the vessel was ascertained by frequent observation, and estimated distance from shore. Twenty-seven fathoms of water, bottom of sand, mud, and shells, were found at four miles to the south of Cape Santa Marta Grande; and beyond that, in going to Torres, the water diminished to 4½ fathoms, near the shore. We may judge of the decrease of bottom, in remarking that, from the 27 fathoms to the 4½, there is a distance of 25 leagues.

"The *Praya do Fernambuco*, between the parallels of 30 and 31 degrees, is more steep than that of Torres. The *Emulation* found 35 fathoms of water, bottom of mud and sand, at 4 or 5 miles from the shore. On sailing out in the offing, to the distance of 15 leagues, the depths of water increase progressively to 85 fathoms, soft sand: passing this limit there was no bottom at 100 brasses, or 91 fathoms. At ten leagues out the depth is about 74 fathoms.

"The *Praya do Destreito* terminates at the Rio Grande de San Pedro, as above-mentioned; from 9 to 13 fathoms were found in coasting along it, at 3 or 4 miles; at this distance the Emulation ran 17 leagues, over a bottom of sand. The shore is not higher than that of Fernambuco, but there are some sand-hills more elevated, and there is more vegetation. In the offing, at 20 or 24 leagues S. E. from this beach, are 34 and 35 fathoms of water, bottom of mud and sand; and, on approaching the land, the depths gradually diminish.

Reid's Shoal. Mr. Reid, of the brig Sweet Home, of Aberdeen, states in a letter, dated Rio Grande, March 14th, 1842,—"The vessel, on her voyage from Liverpool to that port, struck on a shoal, in latitude 31° 3′ S., and longitude 49° 47′ W., at least 70 miles off the Brazilian coast; luckily there was no sea on, and the wind was N. E. by E., which enabled her to clear the shoal immediately, making but little water. After his arrival at Rio Grande, the master of the Sweet Home ascertained that a Brazilian schooner had grounded on the same reef a short time before. The reef, or shoal, alluded to, has not been laid down in any chart, and lies immediately in the track of vessels bound to that port. *Shipping Gazette, July 1st*, 1842.

The Rio Grande, or entrance to the Great Lake of St. Pedro, lies in latitude 32° 9′ S.; but vessels having a N. E., E. N. E., or Easterly wind (any other wind may be dangerous that is from the sea) should make the land in latitude 31° 30′ S.; you may stand with security for the land, steering W. S. W., until you find yourself in soundings, and when you find yourself in 13 fathoms, you will see the land, if to the northward of the bar; but, if you have passed it, you will not, as the bank to the southward stretches out to a greater distance; and you cannot see the land, unless when you are in 8 fathoms, and then barely.

The land, about 31° 40′, you will know by seeing several tufts of trees, pretty high and rounding to the northward; and, standing along shore, steering S. W., you will see sundry straggling tufts, but not so high. Here, if it be very clear weather, you may see houses, which will appear in the opening of the trees; you may then stand along shore with safety, keeping in from 10 to 9 or 8 fathoms. Losing sight of the trees and houses you will see some mountains of sand, and an entire sandy beach; and, when you are within two leagues of the bar, you will see tufts of trees, and find the soundings decrease, with a bottom of mud and red shells. You must now keep in 8 fathoms, but not less, as the water sets right on shore when close to the beach. The lead must now be kept going until you find soft mud, when you will find yourself close to the bar, which may be known by seeing several stakes along the beach; you must then haul up and steer south, to keep clear of the bank. You may easily know the bank by the sea breaking over it, particularly from the eastward.*

Directions for entering the Port of Rio Grande, *by* Captain James Harrison, *of the Brig General Wolfe. Nautical Magazine, October*, 1836. "No vessel drawing more than ten and a half, or eleven feet, should attempt to enter the port of Rio Grande de San Pedro, and she must have a leading wind to cross the bar.

"The land ought to be made to the north-east of the bar, in about latitude 32° S.; there is no difficulty in doing this, as the soundings are perfectly regular, about 60 fathoms at 60 miles distance, and shoaling very gradually; when in 10 or 11 fathoms you will see the land. It is not advisable to get in shore to the southward of the bar.

"The coast is little known, and I never could get any of the coasters, or pilots, to give me any information about the shoals said to exist thereabouts. In general, but not always, the bottom is mud to the southward and abreast of the bar, whilst it is usually sand to the northward; and, if to the southward of the port, the land will not be seen till you are in 7 or 8 fathoms. I do not know of any mark to tell how far you are from the port, as the whole shore consists of low sand-hills, interspersed with bushes, and these hills alter their shapes with every gale of wind. The town of the Estreito lies about thirty miles N. E. of the bar, but you must be close in shore to see it; this is the only object which breaks the sameness in the appearance of the coast for many miles. The latitude is the best guide.

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* The following letter appeared in the *Nautical Magazine for* 1843, *page* 131; its date is Rio Grande de San Pedro do Sul, June 20th, 1842, signed J. Houghton.—"A vessel arriving here should not draw more than 10 feet 6 inches water, in consequence of the shoalness of the bar, particularly when the winds have prevailed for some time from the West or N. W. Make the land about the Estreito, 8 leagues to the northward, where the anchorage ground is good, and where a vessel may come-to with safety with any other than a south-easterly wind; provided there is no possibility of getting in that day, and which I should recommend in preference to standing off and on, at the risk of being drifted away by the current. Early the following day get under-way, coasting it down, not venturing in less than 4½ fathoms of water, until you come in sight of a white tower, which is a very conspicuous object; this lately has been made higher; there is a lantern on the summit, which is lighted at night.

"The tower must be brought to bear north, when a flag will be seen on the top; if this signal is kept up a vessel may enter; if lowered down she must go out to sea again. After you have crossed the bar come to an anchor near the gun-boat stationed there, until you have received a visit, when a pilot will come on board and take the vessel up to the town. It is of importance that vessels coming here should be of light draught of water, as the canal up to the town is very shallow, and vessels have generally to be lightened before they go up. All other information is contained in the Book of Directions; but, as no recent account has appeared, I think it would be doing a great service to masters of vessels coming here to publish the above in the *Nautical.*"

"After making the land, run down at a convenient distance, till you see a square white tower, which stands at the entrance of the harbour, in latitude 32° 9′ S.; this is a very conspicuous object, makes like a sail at a distance, and may be seen some time before the land about it. On the top of this tower a man is stationed, who, as soon as he perceives a vessel, hoists a red flag, when the pilot boat goes out to sound the bar; as soon as you see the tower distinctly, hoist the signals corresponding to your draft of water at the fore. When you get down to within three or four miles of the tower haul in shore, into four fathoms and a half, if a commanding breeze; or you may bring the tower to bear W. by S. ½ S., and steer for it, when you will soon see the boat at anchor on the bar, with the signal, corresponding to the depth of water on the bar, flying at the mast-head.

NORTH-EAST BAR. "Should there not be sufficient water for you, the red flag on the tower will now be hauled down, when you must haul out to sea, and cruise off and on till the water rises. Sometimes a vessel gets down near the bar before the boat gets out; in this case the red flag will be hauled down, and you must keep off and on till she arrives at her station; you will probably see her beating out, but do not attempt to run for her until the red flag is up again. Do not lie-to, as there is usually a strong lee current. The boat not being out in time seldom happens now, as the pilots are much more attentive than they used to be. So soon as the flag is up again, steer for the boat.

"Particular attention must now be paid to a man in this boat, who will wave a small red flag, on the end of a long pole, in the direction you are to steer. Thus, if he wants you to steer more in shore, he will point toward the shore, and keep it pointed in that direction till your course is altered sufficiently, when he will lower it; and *vice versa*, luff-to, or bear away immediately, according to the signals he makes. When you get near the boat he will weigh his anchor, and proceed ahead of you; follow in his wake, still paying attention to his signals, and you will soon pass a second boat at anchor: here the water deepens, but the channel is not a cable's length broad. After passing this boat you haul more up toward the guard schooner, and choose your anchorage anywhere to the westward of and near her, (till you are out of quarantine) in from 4 to 8 fathoms, excellent holding ground; do not go to the eastward of her, as she lies on the edge of the bank. Have an anchor ready the moment you are over the bar, as it frequently falls little wind when you open the river, with a strong current setting out over the banks."

N.B.—The New Southern bar, for which the directions will be hereafter given, is now the principal entrance into Rio Grande, as will appear by the following extract of a letter, addressed to the Editor of the Nautical Magazine, by Captain Harrison, dated Liverpool, April 10th, 1838,—"When I wrote to you in August, 1836, respecting the entrance of Rio Grande do San Pedro, I had no idea that a change in the position of the bar would have taken place so soon as it has done; the principal entrance being now to the southward of the tower, instead of to the N. E. of it. In December, 1836, I entered by the N. E. bar, (the one for which I sent you directions) but the pilots said then, that the small swatchway to the southward, which usually had about 7 feet on it, was improving; and in March, 1837, I saw a brig go out by it, drawing 9 feet 3 inches,—still there was no change in the N. E. bar. I arrived there again in October, 1837, and entered by the N. E. bar, drawing 10 feet 6 inches; the pilots then said that the southern bar was far the best. Soon after I arrived the N. E. bar closed up, occasionally opening out again, but never with much water on it, so that vessels now enter by the New Southern bar." *Nautical Magazine, May*, 1838.

NEW SOUTHERN BAR. Captain Harrison, of the brig General Wolfe, in a letter dated Liverpool, April 10th, 1838, addressed to the Editor of the Nautical Magazine, says "The principal entrance into Rio Grande is now to the southward of the tower, instead of the N. E. of it; the directions before given for making the tower may be followed with the wind at N. E., which is the prevailing summer wind; but no vessel can enter with that wind, as the course will be N. E. immediately after crossing the shoal part of the south bar. If the wind is southerly, the land had better be made just to windward of the port, and you may probably enter at once. The signals, mentioned in my former letter, are to be hoisted at the fore, and the red flag on the tower will be hauled down if you cannot enter.

"On making the tower you will perceive, on the top of it, two perpendicular flag-staffs, (one taller than the other) and two horizontal poles; the tall flag-staff is for the red flag, as a signal for you to steer for the bar. With any signals which may be hoisted on the short flag-staff, you have nothing to do; these are intended to intimate to vessels, *in the harbour*, that they can go to sea. Formerly this short flag-staff could not be seen from the sea, being hid by the light-room, which was on the top of the tower; but the light-room was burnt down in January, 1837, and has not since been rebuilt,—of course there is no longer a light. The two horizontal poles, which project from windows a few feet below the top of the tower, are for pointing out to a ship at sea which bar she is to steer for; one of these poles points to the S. W., and the other to the N. E. If the ship be steering for the N. E. bar, and the look-out man wishes her to go to the Southern one, a flag will be run out on the S. W. pole, and *vice versa.* Sometimes, if the look-out man see that a vessel is puzzled to find the bar boat, (which is occasionally not easily seen, on account of the high breakers between here and the ship) he will direct her by means of these flags; steer to the N. E. when the N. E. flag is run out, and to the S. W. when the S. W. is out, paying attention to these in the same as you do to the waving of the flag in the bar boat; as soon as the look-out man perceives that you can see the signals from the bar boat he will desist. Though these horizontal arms are intended for this purpose, and are sometimes used when a vessel gets into danger, a stranger must not rely upon seeing them, as the pilots are very inattentive.

"When I wrote to you before there was an opposition party of pilots, which made them all very much on the alert; this did not last many months, and they soon relapsed into their old careless habits. If running down the coast from the N. E., and proceeding for the south bar, do not haul too close in shore when within three or four miles of the tower, but keep in about 6 fathoms, so that you may clear the bank which fronts the entrance of the river. If the wind will allow you to enter, and there be sufficient water, which will be known by the red flag being kept up, you may bring the tower to bear, and steer for it until you see the bar boat.

Then pay attention to the waving of the flag from the boat, as mentioned in my former letter; when he weighs follow in his wake. The course will be about N. E. immediately after crossing the shoal part of the bar; leave the second boat on your larboard side, and, after passing her, your course will be about N. W.; but you cannot go wrong following in the wake of the bar boat, and paying attention to the waving of his flag.

"This southern bar is, in some respects, better than the other used to be. The channel is considerably broader, and the shoal part much shorter, being not above two cables' length across, and deepening quickly, both outside and inside, to 3, 4, and 5 fathoms. It is to be observed that N. E. winds depress the water, and that South-westers raise it; therefore, you cannot load so deep in the port as formerly, as you cannot get out with a S. W. wind; again, if a S. W. wind blows strong, which it frequently does, at its very commencement, it raises such a sea, on this southern bar, as to render it impassable for a vessel which may be outside,—in fact, the bar boat could not get out. I came over this southern bar in December, 1837, drawing 11 feet 3 inches, with a northerly wind, and the water unusually high for the wind in that direction; the brig thumped over all the shoal part. Fortunately the sea was a-beam, so that she fell bodily on her keel fore and aft; and, as the ground is not hard, she did herself no harm. I do not think any vessel ought to go there drawing more than 10 feet 6 inches, though many do so.

"With a S. E. wind I would not advise any one to run for the coast, unless the weather promises to be quite fine. With the wind from the N. E., round to the northward, there is pretty good anchorage, in 5 or 6 fathoms, just outside the southern bar; you will be sheltered by the bank to the N. E., and if the wind come round to N. W. you may enter, but beware of a south-easter. There is plenty of room for a fore and aft rigged craft, of little water, to beat over the bar, but the current generally runs too strong with the wind. According to the pilots, this southern bar is nearly in the same position that it was about fourteen years ago; and that it gradually moved to the N. E. until it got close to the shore, about two miles to the N. E. of the tower, when (as we have seen) it closed up the bank, at the same time opening out again to the southern. I should therefore suppose it likely that this would do the same.

"There are no regular tides in the Rio Grande; the current commonly runs with the wind, and, as in the river Plata, and I believe all along this coast, S. W. winds raise the water, and north-easters depress it; consequently a vessel may load in the port to 12 feet, as there is almost always plenty of water with the S. W. wind, which blows right over the bar.

"The S. W. storms, called *Pamperos* by the Buenos-ayreans, and *Rebojos* by the Brazilians, blow furiously in here in winter, about the full and change. They usually come on with a sudden gust, though the appearance of the sky gives sufficient warning for some time first, and blow very hard indeed for five or six hours, when the wind decreases, and a few days of very fine weather succeed; sometimes they draw round to the South and S. E. before the wind abates, which renders it highly dangerous for a vessel near the coast. As the water is shoal there is a deep ground swell, which sets a ship very fast in-shore. It may be as well to observe that the signals are made in palms, each palm being 9 inches. I am aware that the proper Portuguese palm is somewhat less, but 9 inches is always the calculation made here for the draught of water."

The signals, to be hoisted at the fore topgallant mast-head, on making the tower of Rio Grande de San Pedro, in 1836, were as follow:—

A white pendant signifies 7 palms, or 5 feet 3 inches English.
A blue pendant, 8 palms, or 6 feet.
A red pendant, 9 palms, or 6 feet 9 inches.
A white flag, 10 palms, or 7 feet 6 inches.
A blue flag, 10½ palms, or 7 feet 10½ inches.
A red flag, 11 palms, or 8 feet 3 inches.
A white flag over a blue flag, 11½ palms, or 8 feet 7½ inches.
A blue flag over a white flag, 12 palms, or 9 feet.
A white flag over a red flag, 12½ palms, or 9 feet 4½ inches.
A red flag over a white flag, 13 palms, or 9 feet 9 inches.
A blue flag over a red flag, 13½ palms, or 10 feet 1½ inches.
A red flag over a blue flag, 14 palms, or 10 feet 6 inches.
A blue pendant over a white flag, 14½ palms, or 10 feet 10½ inches.
A white flag over a blue pendant, 15 palms, or 11 feet 3 inches.
A blue pendant over a blue flag, 15½ palms, or 11 feet 7½ inches.
A blue flag over a blue pendant, 16 palms, or 12 feet.
A blue pendant over a red flag, 16½ palms, or 12 feet 4½ inches.
A red flag over a blue pendant, 17 palms, or 12 feet 9 inches.

From the bar of St. Pedro to Cape Santa Maria, or St. Mary, at the entrance of the river Plata, the distance is 60 leagues; between the coast is generally low and flat. In the parallel of 34° 20′ are the Castelhos, or Castellos Grandes rocks, and 9 leagues to the north of which are the Castelhos Chicos. From the Castelhos Grandes to Cape St. Mary, the distance is seven leagues; from Cape St. Mary to the east point of Maldonado, the bearing and distance are S. W. ¾ W., 14 leagues.

The following directions were published from the Department State, at Washington, on the 16th July, 1842. All vessels bound to Rio Grande of San Pedro do Sul, coming from the north, should keep in 6, and 6½ fathoms of water, until they bring the tower to bear N. N. W., when they will see the pilot boat on the bar, and the tower, with a red flag hoisted, which is the signal to approach the bar to enter; if the flag on the tower is hauled down, vessels should lay off and on until it is again hoisted, and, when they cannot get in, they should keep under sail if the wind is from N. to N. E. The winds that prevail, generally, after mid-day to dark, are E. N. E. to East, from December to April; and, when unable to get in during these months, they can anchor in 7 or 7½ fathoms of water, bringing the tower to bear N. N. W. If preferred to keep under-way, ought not to approach the shore to less water than 7 or 6½ fathoms, and to stand to sea as far as 14 fathoms water.

Vessels coming from the south should keep in 6 fathoms water, until the tower bears North, the wind being from West to S. E.; the course in is North and South with the tower. If not able to enter, and wishing to anchor, it should be in 7 fathoms, the tower bearing North and South; this from May to November, when the prevailing winds are West to S. E. Vessels should not draw over 16 to 17 palms bound to this place. The wind being from S. W. to S. E. is the highest water on the bar.

The preceeding directions are good, so long as the bar remains to the southward, but it happens that every 4 or 5 years it changes, and will next be S. E. and E. S. E. When the red flag is hoisted, it is a signal for vessels to approach the bar; if on the tower another flag is hoisted to the south, the vessel should sail further south, until it is hauled down,—in like manner, if a second is hoisted to the north, and a vessel is to the south, she should sail further to the north. If no flag is hoisted on the tower, vessels will stand off and on, or anchor, as already described. Navigating during the night, along the coast, the bottom, both to the north and south, is sand of different kinds,—but muddy bottom is in front of the bar, and a vessel should keep within as short a distance as it is practicable.

Bar of Rio Grande, April 15th, 1842.

(Signed) Izidoro da Costa e Oliveira,
Inspector of the Bar, for the Province of de San Pedro do Sul.

N.B.—The palm is about 9 English inches. The signals, for vessels to hoist, are the same as hitherto. When crossing the bar, vessels should follow the pilot boat, and luff or fall off in the direction the flag is pointed by the boat.

RIO DE LA PLATA.

GENERAL DIRECTION. Vessels bound to the Rio de le Plata should make the land of Cape St. Mary, in latitude 34° 40′ S., and longitude 53° 56′ W.; this may be considered the northernmost point of entrance to the Rio de la Plata; the point is low, with several rocks about it, and the direction of the coast, to the westward of it, is more westerly than at any other part northward of it. About 6 miles north of it is a house, and a row of trees is to the northward of the house, which are very remarkable; a mile S. of this house is a bluff point, with a few rocks at its foot, which, being different from the rest of the coast, will readily be distinguished: the general character of the coast is a sandy beach. By these marks the Cape may be easily known, when running down the coast near it; between it and the Palmarones, to the northward, there are 10 and 11 fathoms, at a little distance from the shore.

It is advisable not to make the land to the northward of Cape St. Mary, for although there appears no real danger, yet the water, in some places, is shoal a long way off the land, and would alarm strangers; but, in approaching the land, allowance must be made for the current, which sets to the southward with N. and N.E. winds, and with S. E. winds the contrary.

WINDS, &c. Capt. Heywood observes "That at the entrance of the river Plate, the prevailing winds during the summer months, from September to March, are north-easterly, with tolerably clear weather over head, but a dense atmosphere near the horizon. These winds haul gradually to the eastward as you advance up the river; and, about the full and change of the moon, strong breezes from the south-eastward are common at this season, accompanied with rain and foul weather. At Buenos Ayres, during the summer months, the S. E. winds are generally fresh in the daytime, hauling round to the northward in the night.

"During the winter months, from March to September, the prevailing winds, at the entrance of the Plate, are S. W. or more westerly, but up the river more generally from the northward than from the southward of west. The winter season is the best in point of weather, at Buenos Ayres, for the winds being chiefly from the N. W. to S. W. the water is smooth, and the communication can be kept up between the shore and the shipping with more facility. The weather is sometimes, but not frequently, foggy. Fogs are most common in the months of July, August, and September, and prevail more at the entrance of the river, as far up as the S. E. tail of the Ortiz, than above the banks.

TIDES, &c. "As it cannot be said that there are regular tides in the river Plate, but currents, as uncertain in their duration as they are irregular in the rate and direction, no certain allowance can be made for them; therefore a ground log should always be used, to find the course made good and distance run. The tides, speaking generally, when the weather is fine and settled, and the winds moderate, do not, in any part of this river, rise or fall more than five or six feet; though at Buenos Ayres, at the distance of eight miles from the city, we found in the Nereus, when the winds were strong at N. W., so little sometimes as fifteen feet water; while, with strong breezes at E. S. E. to S. S. W., the depth was upwards of five fathoms; but, except on such extraordinary occasions, we had between seventeen and twenty-two feet water.

"The river Plate has many singularities, which I think, may, in a great measure, be accounted for from its formation being so different from any other known river. Its entrance being very wide and very shallow, it is affected by every change of the wind in a most extraordinary manner; so much so, that a shift of wind may be predicted almost to a certainty, by observing carefully the state of the mercury in a barometer, and the set of the currents, which usually shift before the wind. In calm weather the currents are generally very slack; and then as regular almost, as tides, setting up and down the river alternately. When the winds are variable, the currents are equally so; and I have known the ship to be current-rode four different ways in less than six hours. When the current comes in from the eastward, along the north bank of the Plate, a north-easterly wind may generally be expected to follow; and at the same time (should the wind have been previously to the S. E.) the mercury in the barometer will fall a little; but much more if the transition be quick from south-west, without stopping in the south-eastern quarter.

"When the wind continues in the north-east quarter, the mercury is more depressed (according to its strength) than with any other wind, and there is usually *then*, a set *into* the river on the north bank, and *out* on the opposite. Indeed, whilst the winds are between N. E. and S. S. E., the current generally runs to the westward past Monte Video, though without much augmenting the depth of the water of that place, but filling the river above the banks.

"The winds between N. N. E. and W. N. W. make the water lowest, the outset being then strongest along the south bank of the river, past the Points del Indio and Memoria; but very inconsiderable along the north bank.

"Before the setting in of a S. W. gale, or pampero, the weather is commonly very unsettled, and the winds unsteady, and variable in the northern and north-western boards, preceded by a considerable fall in the mercury, though it usually rises a little again before the wind shifts to the south-west; and often continues to rise, even though the wind may increase from that quarter.

"Before these winds set in at Buenos Ayres, the current runs up and fills the river unusually high; at the same time as strong an *out-set* is experienced along the north-bank, which continues whilst the winds are strongest from W. S. W. to South, seeming to prove that these winds force up from the southward, a large accumulated body of water past Cape St. Antonio, which can only find a passage out again by the north shore, where they increase the depth of water, as well as up the river, and particularly in the shallow harbour of Monte Video. Whilst the S. W. winds blow, the air is cold, and the atmosphere clear and elastic, in a degree rarely to be met with in any other part of the world. They are generally succeeded by some days of fine serene weather; the wind continuing moderate from the southward, or varying to the eastward.

"I have never known the velocity of the tide or current, in the river Plate, anywhere to exceed three knots, per hour; but I have heard it said by some, that they have found it run at the rate of 6 or 7 miles an hour.

"As the winds, outside the river Plate, and particularly about Cape St. Mary, are most frequently from the north-eastward and northward, except when the S. E. summer and S. W. winter gales blow, about the times of new and full moon. I consider it, on the whole, as most advisable, for ships bound into the river, to get in with the land about the latitude of that cape, which is 34° 40′ S., and its longitude 53° 54′ W. of Greenwich, or 2° 9′ E. of Monte Video.

SOUNDINGS. "In latitude 33° S. the bank of soundings extends, off the land, full thirty-six leagues; where the depth of water, in longitude 50° 20′ W., is ninety-four fathoms, and the quality of the bottom dark olive-coloured mud, or ooze, as it is all along the outermost verge of the bank.*

"In latitude 31° S., and thirty leagues from the land, the bank is steep, and the soundings decrease quickly, in standing to the westward, to twenty-five fathoms twenty leagues from the land.

"In latitude 34° 20′ S., and longitude 51° 50′ W., or about thirty leagues east of the Great Castelhos rock, the depth is sixty-three or sixty-four fathoms, dark mud. In standing in for the land, between the Great Castelhos and Cape St. Mary, the water shoals, in a short distance, from sixty to twenty-five fathoms, and the quality of the bottom changes to sand, which becomes coarser as you approach the coast, and, as far as seven leagues off the shore, is intermixed with shells. This bottom is found only in, and to the northward of, the latitude of Cape St. Mary, except very close in with it.

"To the southward of 34° 40′ S. the bottom is chiefly mud, intermixed with fine sand or gravel; and if a ship happen to be set to the southward of Cape St. Mary, as she hauls in for the land, yet keeps to the northward of Lobos, she will get out of fine sand into dark mud, which is the quality of the bottom (chiefly) between Cape St. Mary and Lobos, as well as eight or nine leagues to the eastward of that island; and, the depth of water, between them, is generally 26 to 20 fathoms.

"In latitude 35° S., and longitude 52° W., or forty-two leagues true east of Lobos, there are about ninety fathoms of water, dark sandy bottom, from whence the bank of soundings takes a S. W. direction. East of Lobos, twenty-seven leagues, the depth is twenty-five fathoms; and in steering in, on its parallel, the same depth nearly continues till very near that island. But, if set a little to the southward of Lobos, the water will shoal even to ten fathoms, perhaps, on a hard, sandy, or gravelly ridge, that extends all the way from the English bank, in its parallel, as far as longitude 52° 30′ W., or full 18 leagues to the eastward of the meridian of Lobos.

"Thus the approach to this river cannot be considered dangerous, if proper care be taken in navigating, and due attention paid to the lead, and to the course steered."

The following are the Honourable Captain Bouverie's description of

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* LAUREL SHOAL, OFF THE RIO DE LA PLATA. The Laurel, M'Donald, from London to Valparaiso, put into the river Plate, on the 19th June, 1822, having been obliged to bear up, to repair some damage sustained by a heavy sea breaking on board her. The master reports as follows:—That on the 15th June, discovered a shoal, in latitude 36° 28′ S., longitude 51° 30′ W.: that it appeared to be about a mile long, and the same in breadth, with a breaking very high over it; that it had the appearance of sand, and little water on it. He passed within half a mile, and then hove-to, sounding with 90 fathoms of line, and found no bottom. He farther states, that he had a good chronometer on board, and was six miles out of his longitude when he made the port of Monte Video.

Cape St. Mary, &c., which I believe to be very correct, and his directions judicious:—"Cape St. Mary is a bluff point, with a few rocks all about it. The direction of the coast, to the westward of the cape, becomes more westerly than at any other part northward of it. About six miles north of it is a house, with a row of trees northward of the house, (probably a fence of high prickly pear-bushes) which is very remarkable.

"About a mile south of the house is a bluff point, with a few rocks at its foot, which is remarkable, being different from the rest of the coast, the general character of which is a sandy beach. One cannot fail knowing the cape by these marks, running down the coast near it; if you are at any great distance off, you will not perceive them. The water, off Cape St. Mary, is shoaler than to the northward; to the north-eastward of the cape, between it and the islet Paloma, you have ten or eleven fathoms, at a little distance from the shore.

"Ships, in general, make the land with North or N. E. winds, therefore, it is best to keep in the latitude of the cape, or a little to the northward of it, till you get soundings, as the current sets to the S. W. It is better not to make the land north of the cape,—not that I believe there is any absolute danger,—but the water, in many places, is shoal a long way off the land, and would alarm any one not acquainted with that circumstance.

"In latitude 33° 27′ S., and longitude 52° 9′ W., is a shoal, where we found 9 fathoms of water; I believe it is a ridge running, in that parallel of latitude, all the way to the shore. In latitude 34° S. is some tolerably high land, on which is a Spanish fortress, called fort Teresa. It is square, with bastions at the angles; it has three guns in the face, and one in the flank, and stands about a mile from the beach. About 6 leagues N. N. E. from it is a mark set up, as the termination of the Spanish territories.

"Being in the latitude of Cape St. Mary, and having got ground in 28 or 30 fathoms of water, fine sand and shells, you may reckon yourself twenty leagues off shore; with from 15 to 20 fathoms, sand and clay mixed, you are not far off the land. When you have not seen the land before night, be sure to keep to the northward of the cape by your reckoning, to allow for the current, which sets to the southward. This is the case with the above-mentioned North and N. E. winds; with South and S. W. winds the current runs strong the other way.

"I am inclined to think that the strong north-easterly currents, which are to be met with off the mouth of the Plata, when the wind is about to blow, or blowing, from the south-westward, do not extend much, if at all, beyond the bank of soundings."

Agreeing in opinion with Captain Bouverie, that, generally speaking, it is advisable to make the land about Cape St. Mary, I would also recommend, if the wind should be anywhere between S. E. and N. N. E. to enter the river on the north side of the English bank, passing Lobos, on either side, according to the wind and state of the weather. There is a good passage between Lobos and the main, having 17 to 14 fathoms water.

The island of Lobos is in latitude 35° 1′ S., and longitude 54° 39′ W., or 1° 24′ East of the Monte Video; it bears about S. W., by the world, from Cape St. Mary, distance forty-one miles. The variation off it, is 13° Easterly (1813).

When within three or four leagues of Cape St. Mary, in 17 or 18 fathoms, S. S. W., by compass, is a fair course to steer for passing outside of Lobos, in the night time, for, with the wind from the Eastward, or N. E., the set along shore into the river must be guarded against. Steering this S. S. W. course, the depth of water will increase to 20 and 22, and some casts, perhaps, of 25 or 27 fathoms, (if you are set neither to the westward nor to the southward of it) and the bottom will change, first to sandy mud, and then to dark-blue mud, as you approach the latitude of Lobos. If you are set to the southward, in steering S. S. W. you will not deepen so much; the bottom will keep sandy, and when you approach the latitude of Lobos, you will have no more than 19, 18, and 17 fathoms; but if you are set to the southward of Lobos a few miles, you will have hard casts of from 16 to 10 fathoms, and may rest assured of being on the parallel of the English bank, and may therefore make a west northerly course, true, till you find the bottom soften, as it is all dark-blue or greenish mud, in the channel, between the foul ridge of the English bank and the north shore, all the way up to Monte Video, in the fair-way from Lobos. When off Lobos, if the weather threaten, and it should be likely to blow, a ship will find safe anchorage in the harbour of Maldonado, sheltered from southerly winds by the island of Goritti, which bears N. 42° W., true, 11 or 12 miles from Lobos. As I have never been in Maldonado myself, I shall insert here what Captain Bouverie says about it.

MALDONADO BAY. "The spanish surveys of this bay lay down a sufficient depth of water for any ship between every part of the island and the main; however, it cannot be safely entered, but by small vessels, except to the westward, and you must not go farther in than to bring the N. W. point of Goritti to bear S. S. W. ½ W., or S. W. by S. by compass, with 4½ or 5 fathoms, good strong clay. With southerly winds there is, in the east passage, a heavy swell, and the water, from the ground being uneven, breaks almost the whole way across, in bad weather. The Diomede (fifty gun ship) passed through to the anchorage before its dangers were known, and had not less than eighteen feet; but there are places where there is so little as 1½ fathom, and it is very irregular. There is a bed of rocks to the south of Goritti; the marks for it are, the tower of Maldonado, North, and the outer part of Point del Este, E. N. E ½ E.

"In the direct line of the entrance of the bay, from the westward, is a bed of rocks where there are parts having only three and quarter-less 3 fathoms. The bearings, taken on the rocks, are N. E. point of Goritti E. ½ S.; N. W. point of ditto, E. by S. ½ S.; S. W. point of ditto, S. E. by S.; Point Ballena, W. by N. ½ N.; the hill of Pan de Azucar, just within the extreme of Point Ballena.

"In mid-channel, between these rocks and the island, are 6½ and 7 fathoms; their distance from the island is about three-quarters of a mile. There are seven fathoms close to them all round the western side. The watering-place is on the main, close by a battery; the stream loses itself in the sand, except when swollen by heavy rains, and you have to roll your casks about sixty yards over the sands; the water is very good."

LOBOS TO FLORES, &c. Having Lobos bearing N. by W., by compass, distance three or four miles, you will have about 18 fathoms; and, in making a compass course, W. ½ S., by ground log, (having due regard to the wind and current at the time) you will make the island of Flores ahead of you. In this track your soundings will gradually decrease from 18 to 12 fathoms, due south of Black point, and to 7 or 8 fathoms when you approach within nine or ten miles of Flores.

Though Captain Bouverie says, "You may run quite up to Monte Video, either by night or day, by making a due west course, first trying the current to make allowance for it;" and though I have frequently done it myself, yet I would not recommend it as a general rule to be followed by strangers to the river Plate. Great care and attention to the course made good, and to the soundings, are indispensably requisite in those who attempt to conduct vessels during the night, in any part of this river; and even these have been but too often insufficient to save ships from destruction. But, in merchant vessels, I fear we cannot always expect to find those qualities, and, therefore, I withhold my opinion of its being advisable for them to run in the night; neither can it be done by men-of-war without some risk.

Flores bears W. 4° 30′ N. (true) from Lobos, distant fifty-two miles. It lies nearly N. E. and S. W., has a small hummock in the middle, and one at each end, that to the S. W. being thirty-nine feet high. Between these the land is low and marshy, and overflowed sometimes between the central and N. E. hummock. It may be seen at the distance of five or six leagues from a ship's deck, in clear weather.

There is good anchorage all around this island; but a reef extends in a N. W. direction from the north point about a mile. Seals and sea-lions, and various aquatic birds resort to this small island, as well as to Lobos; and, in the months of August and September, great quantities of very excellent eggs may be procured. With the wind easterly, boats may land on the western side of Flores, particularly in a small cove, very near the S. W. part of the island.

ENGLISH BANK. From Flores W. N. W. the Caretas rocks (above water) are distant about five miles; and there are 5 fathoms between them. True south, at the distance of eleven miles from Flores, is the north part of the English bank, on which, in that latitude, 35° 8′ S., there were about 12 feet water. The depth of water, between Flores and the English bank, is 7 fathoms, all the way across, to within a very little distance of both. The English bank, in latitude 35° 12′, generally breaks; and, with a low river, is above water in some places. Its extent to the southward has not yet been accurately defined; and, for seventy or eighty miles to the south-eastward of it, the ground is said to be foul and uneven, and has not been explored.

Between the Archimedes and the English bank there is a swatch of 5 fathoms water, (according to Captain Beaufort, of the Royal Navy, who explored these banks in 1807) and as many miles wide.

The shoalest part of the Archimedes bank, about 2¾ fathoms, is four miles in extent, about N. and S. by compass, and there are four fathoms all round it. The centre of it is in latitude 35° 12′ S., and the Monte Video bears N. 22° W. from it, distant twenty miles. Besides this bank there is a small knoll, in latitude 35° 14′ S., which is true south from the Monte Video, twenty-one miles, and has not more than 3½ fathoms of water on it, and about 4 fathoms all round it.

MONTE VIDEO. Passing to the southward of Flores, at the distance of a couple of miles, you have 6½ or 7 fathoms, and may steer W. ½ S., by compass, to pass Point Braba, which bears true W. 4° N., distant four leagues from the S. W. end of Flores. This point is bolder too than the land to the westward, between it and the town of Monte Video, and may be passed close, in 4½ or 5 fathoms, at a mile or a mile and a half distance. The best anchorage for a frigate, off the town of Monte Video, is with Point Braba bearing, by compass, W. by N. ½ N., the cathedral, N. E. by N., and the Mount about N. W. by N., in 3½ or 4 fathoms, two miles or more from the town, with the harbour quite open. The bottom is all soft mud.

The harbour of Monte Video is very shoal, having only from fourteen to nineteen feet water; but the bottom is so very soft that vessels receive no damage by grounding there. Captain Bouverie says, "A S. S. W. wind, which blows right into the harbour, and causes a good deal of sea, always occasions the water to rise a fathom or more.

"In a long continuance of fine weather, the tides sometimes assume the appearance of regularity, but this is not often the case; they are governed entirely by the winds. The winds from the southward cause the water to run out, on the north shore, strongest. Fine weather, and a N. W. wind, make the water lowest. It is usual, in Monte Video harbour, to have an anchor in the S. E., and another to the S. W., and to take one in abaft from the northward, for the water, forced in by the southerly wind, sometimes rushes out with astonishing rapidity, when the anchorage to the north is of the greatest service."*

The MOUNT VIDEO is in latitude 34° 53′ S., longitude 56° 3′ W. of Greenwich; being 1° 24′ W. of the island of Lobos, and 2° 10′ E. from cathedral of Buenos Ayres. On the summit of this mount is a fortified building, whose base is forty-two feet six inches by twenty feet, used sometimes for a lighthouse; the diameter of the lantern is ten feet six inches, and its elevation, above the level of the sea, four hundred and fifty feet. At the base of the mount are several runs of excellent water, particularly in two small, smooth, sandy bays, on the S. W. part of it, where ships in the outer roads may supply themselves with ease; and another on the east side of the mount, just abreast of Rat island, adapted to ships in the harbour.

Giving the preference to the passage on the south side of the English bank, especially when the wind is anywhere between S. S. E. and N. N. E. on passing Lobos, because it may be expected most probably to shift, if it does at all, round by the north to the westward, though, perhaps, not before that wind, and the inset together, might carry a ship up to Monte Video. Yet if the wind should be to the north-westward, at the time of making the land, it may be pretty confidently expected to shift next to the Westward or S. W.; and, therefore, a ship should not strive to beat up, round Lobos and the north channel, against an outset, but stand at once over towards Cape St. Antonio, where, by the time she could stretch across, she would most likely find a S. S. W. wind and N. W. current, to run up with, along a weather shore to Buenos Ayres, or to Monte Video, if bound thither, passing to the westward of the bank of Archimedes, in about 5 fathoms water; or, if the mount should be seen in good time, never to bring it to bear to the westward of North, by compass, till within five leagues of it.

In standing to the southward, from abreast of Cape St. Mary, with the wind south-westerly, a ship will have from 18 to 24 or 25 fathoms when in the latitude of Lobos, and about twelve or thirteen leagues to the eastward of it; and making a S. S. E. course, the water will then shoal to 18, 16, 12, or 11 fathoms, in crossing the ridge, which is generally composed of sand, gray speckled, mixed with stones, hereabouts; after which the depth increases gradually to 35 or 36 fathoms, over a sandy bottom, in latitude 35° 40′ S., and longitude 53° 25′ W. In the latitude of 36° S., and fifteen or twenty miles further to the eastward, you will deepen off the bank entirely. A ship, having got as far to the southward as 36° S., may consider herself in the fair-way for proceeding up on the south side of the English bank; and, if the wind serve, a true west course may be made good.

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* DECREES FROM MONTE VIDEO, 1836. "In consequence of the greater portion of the foreign vessels which arrive from ports in which consuls of the republic reside, and entering their cargoes without having their manifests certified by the said consuls, the government, in order to put a stop to a system so prejudicial, have ordered and decreed:—

"Art. 1.—The captains of merchant-vessels proceeding from foreign ports, in which consuls of the Republic reside, who present their manifest without being certified by the said consul, will be subject to an additional duty of 6 per cent. on the value of the goods.

"2.—The decree of the 17th of January, 1834, remains in full force, respecting vessels arriving from ports, in which no consul resides.

"3.—They except those from the foregoing vessels which arrive from free ports, to whatsoever nation they belong.

(Signed) OREBE J. M. PEREZ.
J. M. REYERS."

A second decree states that the enforcement of the above would, for vessels from Europe, commence in April, 1836, as also for vessels from America.

In latitude 36° S. the depth of water, on the meridian of Cape St. Mary, is 38 fathoms, and the bottom of fine gray sand, like ground pepper.

Keeping still to the westward, on that parallel of 36° S., the depth decreases to 19 or 18 fathoms, true south of Lobos; and for ten leagues farther you have from that to 15 fathoms. But if from the latitude of 36° S., on the meridian of Lobos, you make a W. by N., or W. by N. ½ N. course, true, you will shoal the water to 8 or 7½ fathoms, in latitude 35° 45′ S., on the meridian of the English bank. The quality of the bottom, generally in this track, is sandy, mixed with small stones; and, the nearer you approach to the ridge of the English bank, it is intermixed with bits of shells, and sometimes with clay or mud.

From latitude 35° 45′ S., due S. of the English bank, a W. N. W. true course to latitude 35° 33′ S. will bring the Monte Video to bear North, in about 6½ fathoms, mud, at the distance of thirteen leagues from Point Piedras; and, from this position, the same true course may be made to raise the land about Point del Indio, if bound up to Buenos Ayres; or N. W., or more northerly, to get sight of the Mount Video; having due regard to the set of the current, up or down the river, that you may neither be horsed on the S. E. tail of the Ortiz flats, nor on the western part of the Archimedes bank. The bottom above this is soft mud, or clay, in the channels fit for safe anchorage. In latitude 35° 30′ S., or thereabouts, and due south of the Archimedes bank, or some miles further to the eastward, I have been told by some persons they have had as little as 4 fathoms, hard ground.

POTOMAC BANK. "On the 13th December, 1839, the United States frigate, Potomac, left Monte Video, with the wind E. S. E. at the time, and while steering N. W. by N., by compass, believing themselves to be about 5 miles from the ravines of St. Gregory and St. Lucia, the leadsman having at the previous minute got a cast in 4 fathoms, the ship ran aground in 17 feet water, drawing at the time 20 feet 6 inches. She was cleared of everything, excepting her ballast and lower masts, and, after remaining fast until the 24th of December, by great exertions she was hove off S. by W.,—their efforts to heave her off stern foremost having proved ineffectual, and her tendency being to clear away the sand and mud forwards, where she was less deeply immersed than aft; when she floated she drew 17 feet 6 inches. The wind was S. E. when she got off, fine weather, with a remarkable high river. During the eleven days they were aground, the least water they had alongside was 12 feet, the most (the day she hove off) 18 feet. The surface of the shoal consisted of a light coloured quicksand, but about 3 feet was mud and shells. When the Potomac was aground *the true* bearings of Santa Maria, and the ravines of St. Gregory and St. Lucia, were N. W. and N. E." *Nautical Magazine for* 1841, *page* 361.

MONTE VIDEO TO BUENOS AYRES. Ships leaving Monte Video, to proceed up to Buenos Ayres, must be very attentive to the lead, and the course steered across the river must be very carefully regulated by the set of the current at the time. If the weather be sufficiently clear, the mount is the most sure guide, keeping it, by an azimuth compass, on the magnetic bearing N. E. by N.; and, when it sinks to an eye in the top, a more westerly course may be steered, to raise the land about Point del Indio. This direction is intended to apply particularly to frigates, or any ships drawing more than fifteen feet water, because it is not advisable for them to cross the tail of the Ortiz flats, much further to the westward than a true S. W. course from the mount will take them; for, with a low river, I have had barely 3¼ fathoms, in the Nereus, with the mount bearing N. 35° E., by compass, distant ten leagues. At other times I have sunk the mount on a N. 53° E. magnetic bearing, and had as much as 3½ fathoms water, but the river was then well filled.

On the south-eastern part of the Ortiz bank, which is there hard stony sand, there is still remaining (1813) part of a mast, or beacon, about twelve or thirteen feet high; it is in latitude 35° 2′ 15″ S., and 0° 45′ West of Mount Video, from which it bears W. 14° S., thirty-seven miles. There is about twelve or thirteen feet alongside of it, 3 fathoms two miles to the eastward of it, but not more than ten or twelve feet as far as three miles S. W. of it. Point del Indio bears true S. 33° W., sixteen or seventeen miles from it.

For the distance of full seventeen miles to the south-eastward of the Ortiz beacon there is, generally, no more, and often less, than 3½ fathoms, the bottom tough clay nearest the bank, and in some places farther to the south-eastward, soft mud, not more than 3¼ fathoms.

After sinking the mount about N. E. by N., and having 3½ fathoms, a W. S. W. course will raise the land (if the weather is clear) about Point del Indio to the eye, at the mast-head, and probably you will not have more than 3¼, or, at best, 3½ fathoms. The mount and land, near Point del Indio, are sometimes visible at the same time.

Point del Indio is in latitude about 35° 16′ S., and 0° 56′ W. of the Mount Video, from which it bears S. 63° W., distant fifty miles. There is little more than 3 fathoms, at the distance of ten or eleven miles, when the river is in a mean state; farther to the southward, and off Point Piedras, there is only that depth fourteen or fifteen miles off shore. Very great caution, therefore, is required in approaching it; and a constant look-out should be kept for the land, as it is very low, and cannot be seen farther than twelve or thirteen miles, in any weather, from the deck of a frigate.

When the land is barely raised to an eye nineteen or twenty feet above the surface of the water, a W. N. W. magnetic course will lead along shore, between it and the south part of the Ortiz, which is distant about fourteen miles from it, and, between them, there is nowhere more water than 3½, but mostly 3¼ fathoms. With a high river I have had a quarter-less 4 fathoms: the nearer the Ortiz the deeper the water.

In steering up W. N. W., with the land seen from the deck, (if clear weather) you will have 3½, or 3¼ fathoms, (yet if the river is low, perhaps some casts of 3 fathoms) and raise a remarkable clump of trees, called Embudo, which are much taller than the rest, highest at the west end, and lie in latitude 35° 5′ S., and in longitude 1° 16′ 30″ West of the Mount Video; or 0° 57′ 30″ East of the cathedral of Buenos Ayres. At some distance to the westward of the Embudo trees there is another clump, about the same height; but these being highest at the east end, are sufficiently distinguished not to be mistaken for the true Embudo.

When in 3½, or 3¼ fathoms, the Embudo trees bear, by compass, W. S. W.; the S. E. end of the Chico bank will bear W. N. W., or thereabouts, ten or eleven miles from you; and you must now determine, from the water your ship draws, and the then direction of the wind, and state of the weather, whether you will pass between the Chico and the shore, or between the Ortiz and the Chico.

I have passed up and down several times between the Chico and the south shore, in the Nereus, lightened in her draft to eighteen feet three inches, but I would never attempt it again from choice; now I am better acquainted with the middle channel, between the Chico and the Ortiz, and have every reason to believe that the middle ground, some Charts lay down in it, does not exist.

A ship not drawing more than fifteen feet may take either passage; and, of the two, ought, perhaps, to prefer that to the southward of the Chico bank, particularly if the wind should be well to the southward, as she might take her soundings from the weather shore, and, keeping in somewhat more than her own draft, run up along it, and by not deepening above 3 fathoms, would ensure being to the southward of the Chico.

CHICO BANKS, &c. The S. E. end of the Chico bank bears, from the Embudo trees, N. 32° E., true, distant ten miles, and E. 9° N., thirteen miles from Atalaya church; its latitude there is 34° 56′ 30″ S., and longitude 1° 9′ W. of the Mount Video. This bank runs in the direction of N. 52° W. true, or N. 65° W. by compass, about 13 miles to its N. W. end, which is in latitude 34° 48′ 50″ S., and 0° 47′ East of Buenos Ayres' cathedral. From this N. W. end, in fourteen feet water, Atalaya church bears S. 14° W., distant eleven miles; and Point Santiago, forming the Ensenada de Barragan, bears W. 4° N., fourteen miles from it. The breadth of the Chico does not exceed two miles, or perhaps a mile and a half, and its inner edge is about nine miles from the shore. The water between it and the shore is nowhere more than 3½ fathoms, and the deepest water is along the inner edge of the shoal, at the distance of half a mile from it, or less in some places. About midway between it and the shore there is a quarter-less 3 fathoms; on some parts of the Chico there is very little water, and, within the limits I have assigned to it, nowhere more than fourteen feet.

To ships drawing less than fifteen feet, it is only further necessary to recommend care and attention on approaching Point St. Iago, which forms bushy and distinct; and, when it is brought to bear to the south-westward, haul out into the stream of 3½ fathoms, to round outside the spit, which runs about N. W., by compass, from Point St. Iago, at least ten or eleven miles; its extreme point, in 2 fathoms, being about five miles from the shore. When two remarkable trees on Point Lara are brought to bear S. by E. ½ E., or S. S. E., by compass, you are past the spit; this mark will also lead a ship of that draught of water clear to the westward of the spit, in running in towards the Ensenada.

After passing the spit off Point St. Iago, in 3½ fathoms, a W. by N. Northerly course, by compass, will lead up to the outer road of Buenos Ayres, where any ship may safely anchor in the water she draws, if the river is low.

Frigates, or any vessels drawing more than sixteen feet water, should barely raise the land about Point del Indio to the eye on deck, and borrow nearest the Ortiz, more particularly when the Embudo trees are brought to bear as far as S. W. by W. (magnetic); for, with the Embudo bearing from S. W. to S. S. W., the bottom is flat, off to three fathoms, full seven miles from the shore, and chiefly hard clay. Therefore, when the Embudo trees bear W. S. W., by compass, and you are about nine or ten miles off shore, in 3½ fathoms, if you have a leading wind, haul to the N. W. by W., or more Northerly, as may be required to clear the S. E. tail of the Chico, and you will soon deepen your water to four fathoms, and more, in the middle channel, between the Chico and the Ortiz shoal. The fair course through, between them, is about N. W. by W. ½ W. (magnetic) and, in mid-channel, the land can but just be distinguished from the quarter-deck of a frigate. When the Embudo trees bear S. 20° W., by compass, you will be abreast of the S. E. end of the Chico, and may either take your shoal soundings along its northern, or outer edge, to about a quarter-less four, if the wind is southerly; or, if the wind be northerly, or easterly, borrow into a convenient depth along the southern edge of the Ortiz. I believe the breadth of this middle channel may be five or six miles, and the depth of water from 4 to 5½ and even 6 fathoms, in the fair-way, about the N. W. part of it, and abreast that end of the Chico. The quality of the ground, all the way through this channel, is generally soft mud, and fit for safe anchorage.

BUENOS AYRES. The N. W. pitch of the Chico bank being passed, and the depth of water 5 or 5½ fathoms, you may steer, by compass, W. by N. ½ N., or W. by N., for Buenos Ayres, taking care not to shoal under quarter-less four, off Ensenada, till point Lara trees bear S. S. E.

A little more than half-way from Point Lara to Buenos Ayres there are two other remarkable trees; when moored off Buenos Ayres, in the Nereus, in 19 feet water, and the bottom soft mud, these trees bore, by compass, S. 17° E.; the cathedral S. 67° W.; and the spire of the Recoleta convent S. 76° W.; the latitude observed 34° 34′ 30″ S., and the longitude, by the moon, 58° 2′ W. of Greenwich. Variation of the compass 12½° Easterly, at the distance of eight miles from the cathedral.

Observations on the anchorage off Buenos Ayres, by Mr. R. Thompson, Master of H. M. S. Imogene. *Nautical Magazine, April*, 1838, *page* 222.

"On the 22nd October, 1836, we left Monte Video for Buenos Ayres, with a pilot on board. At Monte Video moorings are laid down for the pilot schooner, which lies with Point Indio bearing S. W. by S. (compass) ten or eleven miles, and she generally keeps a light at her mast-head. This is a good guide for vessels passing up, enabling them to shape a course between the Chico and Ortiz banks; or, in passing down the river, it enables them to shape a course clear of the east end of the Ortiz, or for clearing the English bank. In fact, if the vessel can be made, she will always give a sure departure, a most desirable object in this uncertain river.

"On leaving Monte Video, and bound for Buenos Ayres, if the pilot schooner be not seen where and when the pilot expects to see her, there cannot be a doubt of her having left her moorings, or that the vessel is not in a proper place. At the time we expected to see her (which was midnight, and we burnt several blue lights, as well as fired several guns, in order to draw their attention) she was at Buenos Ayres.

"Having missed the vessel, or being unable to find her, I would strongly recommend anchoring until day-light, and taking a departure from Point Indio, or the Embudo trees, all well described in the sailing directions of this place.

"On the 23rd we anchored off Buenos Ayres, with the cathedral bearing S. W. by W.; Point Guilmas S. by E. ¼ E., about seven miles from the shore; and, on the 25th, shifted our berth nearer the shore two miles, and moored with best bower E. S. E., small bower W. N. W., fifty fathoms each, Buenos Ayres Mill bearing S. W. ½ S.; this is a better anchorage than when we left, as there is generally four and sometimes six feet more water, and it is full two miles nearer the shore.

"I cannot say much in favour of the anchorage here, as it is open to all points of the compass, and a great distance from the shore; in fact, the communication with the shore is, at all times, very uncertain, and they are frequently three days without sending a boat; even when they are sent there is great uncertainty attending their return for a day or two. While we lay here (eight weeks) we found the mooring swivel of great use; it was well tried during the heavy gales we rode out. The prevailing winds were E. and N. E.; the tides are very irregular, but, at times, running as much as 3½ miles an hour: we had from 19 to 25 feet water."

The following are the PORT CHARGES, entrance at Buenos Ayres.

Foreign Vessels.	Dollars.*	National and English.	Dollars.	Reals.
Per Ton	1	Per Ton	,,	6
Health visit	12	Health visit	6	,,
Copy of Regulations of Port	1	Copy of Regulations of Port	1	,,
Clearance.				
		Per Ton	,,	6
Per Ton	1	Health visit	6	,,
Health visit	12	Muster-Roll of ships Company	12	,,

N. B.—Vessels which neither load nor discharge, pay one half the charges, besides the health visit, on arriving, and the health certificate on clearing (addition since August 1st, 1833); vessels of three masts pay ninety dollars, and those of two masts fifty dollars pilotage, on entering and clearing from the inner roads, although they do not demand a pilot.

PILOT CHARGES.

For vessels drawing Burgos feet.	From C. S. Mary to Monte Video.	From Monte Video to Ensenada and Buenos Ayres.	From Cape St. Mary and C. S. Antonio to Buenos Ayres.
20	720	900	1140
19	600	780	1050
18	540	660	960
17	480	570	840
16	420	480	750
15	360	420	660
14	300	360	570
13	240	270	480
12	210	240	420
11	180	210	360
10	150	180	300

"All vessels drawing more than 10 feet must take a pilot on clearing, and in case of refusing so to do, the captain will be obliged to pay one half of the pilot charges, to which he is liable; he also will pay the same, who on entrance, shall have refused to take a pilot, the same having been offered to him, with a list of pilot charges above stated.

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* The Dollar here mentioned is paper, value about 7½d.

"The outer and inner roads are, in fact, open roadsteads, neither of them possessing good anchorage; a strong wind from E. or S. E. blowing almost direct on land, is dangerous to those in the inner roads, and they frequently drive.

"It is said that the winter season is much better for shipping than the summer, as in the latter the winds are more from the eastward. Good anchors and cables are very necessary in the river Plate, chain cables particularly.

"In addition to the difficulty of large vessels getting up the river, an adequate freight cannot be procured for them; but vessels of 150 to 200 tons, are the most likely to get employed.

"Vessels discharge and take in their cargoes by means of lighters, called Balandias; should there be the least swell upon the water, these lighters cannot lie alongside. Boat-hire is dear, to the outer roads 25 shillings (English).

"The climate, considered generally, is decidedly good. The spring months of September, October, November, and those of autumn, April and May, are the most agreeable parts of the year. During the former, we have had some days of oppressive heat, the thermometer ranging from 69° to 85° in the shade. When the heat is at the greatest, a pampero frequently follows, with its accompaniments of rain, thunder, and lightning. These winds from W. to S. W. blow with great violence; being off the land, they are not very dangerous to shipping, but the thunder and lightning by which they are accompanied is terrific. A north wind in summer is very unpleasant, the heated atmosphere relaxing both mind and body; added to this, ships are swarmed with mosquitoes and numerous other insects.

"The beach of Buenos Ayres well deserves its nickname of Wapping, being crowded with sailors of all nations, grog-shops, stores, &c. In no part of the world are masters of merchant vessels subject to such annoyance from the desertion of their crews. There are crimps here who conceal them in the town, or send them to the country, and afterwards exact their own price from those who are in want of sailors.

"The necessaries of life are abundant, and reasonable in price. The beef is good, but much inferior to English. Vegetables are at all times dear; potatoes imported to pay a duty of 50 per cent, and the growth of this invaluable vegetable is not in anyway encouraged: I have known them sell at 8d. per lb. In summer meat will not keep beyond a day. We have been obliged to throw overboard some hundred pounds of beef, slaughtered not more than twelve hours. The poultry is not of the best description. Fish is very inferior, but plenty may be caught alongside. We had no opportunity of trying the seine

"Fuel is scarce in Buenos Ayres, as it is not a woody country. Coals are imported from England.

"The export consists of ox hides of all descriptions, horse hides, horse hair, wool, tallow, nutkea, skins, horns, chinchilla skins, and salted beef, (the latter sent chiefly to the Havanna and Brazils) and a small quantity of silver in bars. Of late years the wool trade has greatly increased. The quantity of European goods annually imported is very great. The cargoes brought from Liverpool, of manufactured goods of Manchester, Glasgow, &c., are of considerable value, often amounting to £100,000.

"The state of the tides sometimes causes great delay to vessels leaving the inner roads, days, and even a week being lost at some periods.

"Landing at Buenos Ayres is very bad; heavy boats cannot get near. Carts are used to embark and disembark, there seldom being water sufficient for boats to go close in, and they are at all times liable to serious damage from the pieces of rock, wrecks, &c., so near the shore. The cartmen charge one dollar (paper money equal to 7½d.) each trip.

LANDFALLS, *on approaching the* Rio Plata, *as described by* Captain Barral. These are three; the *Cape Santa Maria*, the *Isle Lobos*, and *Cape San Antonio.*

Of Cape Sta. Maria the position, determined on land, has been found to be in latitude 34° 39′ 1″ S., longitude 54° 5′ W. nearly. The variation of the needle, Feb., 1831, 11° 7′ E. Although of very moderate elevation, this cape may be known by the vicinity of two islets, named *Tuna* and *Paloma*, which are separated from each other by a space of 43 fathoms in extent, and which forms a passage for small vessels, drawing less than 10 feet of water; this is the entrance to a cove, sheltered by the cape and the two islets, wherein 7 or 8 vessels may lie in 11 or 12 feet. The islet *Tuna*, the nearest to the cape, is covered with the prickly pear. On coming from the offing there will be seen an extensive sand-down, steep-to, followed by a very low beach. To the north, on a hill, is seen a groupe of houses; near these are some trees, and around are several inclosures. The coast to the north forms a large bay, of 14 miles in extent, with a point encircled by the islets Palmarones and Castillos. The resemblance of the point to that of Cape Sta. Maria has caused several wrecks; from this reason the bay has been called *False bay.* At two miles to the east of Castillos are 14 fathoms of water, bottom of sand. From the islets of Cape Sta. Maria, at the distance, are 10 fathoms with sand, or sand and gravel; to the south, at three miles, 18 fathoms, sand; and to the S. W., 16 to 20 fathoms, bottom of ooze.

Lobos or Seal island is situate in latitude 35° 0′ 51″ S., and longitude 54° 49′ 22″ W.; it is not a mile in extent, but may be seen 15 or 16 miles off, The eastern part must be avoided, because a chain of reefs extend three miles from it, into the offing. Large ships pass safely through the channel between the isle and main, in 15 and 16 fathoms of water.

Cape San Antonio. Under this name we comprehend a line of hillocks, composed of sand, extending to the east and the south, and terminating on the west by a very low coast, covered with shrubs or small trees. The position, determined from the anchorage, is given as latitude 36° 19′ 36″ S., longitude 56° 42′ 22″ W. Variation of the needle, December, 1831, 13° 30′ E. The point determined is at the division between the sand-hills and verdant shore. The cape is surrounded by a sand-bank, which frequently breaks at a considerable distance from shore; it extends to the north and east, and should not be approached without caution.

DESCRIPTION. The MOUTH of the RIO de la PLATA, between the east point of Maldonado on the north, to Cape St. Antonio on the south, is 42 leagues in breadth. The bearing from one to the other is S. W. ¼ S. [*S. W. ¾ W.*] An extensive bank, with several shoals upon it, occupies the greater portion of this space; but there is a channel both to the northward and southward of the bank, of which that to the northward, about 5 leagues broad, in its narrowest part, is the chief.

The narrow rocky islet, Lobos, mentioned above, with a cluster of rocks extending from it to the eastward, lies at the distance of 5 miles, S. E. ½ E. [*S. E. ½ S.*] from the eastern point of Maldonado, in latitude 35° 1′ S. At 18 leagues W. ¾ S. [*W. ½ N.*] from Lobos, is another small isle, Flores, in latitude 34° 56′ 20″ S., now rendered conspicuous by a lighthouse; it exhibits a brilliant light, with revolving eclipses. It stands on the highest

S. W. part of the isle, whereof the height above the level of the sea is 63 palms or 45 feet. The height of the lantern is 75 palms or 54 feet, so that the total height is 138 palms, or 99 English feet. To the westward of Flores, distant 16 miles, is the port of Monte Video, on the western side of which, upon the summit of the mount, is another lighthouse, 478 feet above the sea.

On a S. W. line from Monte Video the river contracts its breadth to that of 56 miles, where *Ponta de Piedras*, or *Rocky point*, presents its face to the east. At four leagues higher, in latitude 35° 16′ S., longitude 57° 6′ W., is *Point Indio*, distinguished by trees; and at about 22 miles above, or to the north-westward of this, is the village of *Magdalena*, with several *Estancias* or cattle farms Ten miles above Magdalena is the *Atalaya* church; and, at 4½ leagues higher is *Point S. Iago* and the *Ensenada*, or Careening place of *Barrogan*, which are 9 leagues below *Buenos Ayres.* On all the coast between Point Piedras and Point S. Iago the water is shoal to a considerable distance from shore, with 3 to 2 fathoms, hard ground.

Extensive banks, called the ORTIZ (or *Orthes*) and CHICO, occupy a great portion of the central part of the river, north-westward of Point Piedras, and they form three channels, of which the deepest is the middle one, between the Ortiz and Chico. The general depths in this are from 3½ to 4, 5, and sometimes to 6 fathoms. In the southern channel, between the Chico and shore, the depths are 3½ and 3 fathoms; and in the northern they are only 3 and and 2½ fathoms.

THE SOUTHERN CHANNELS were buoyed in 1823, when four black buoys were laid on the south side of the Ortiz, and four red ones on the Chico. The other buoys have also been laid higher up, off the coast between Point S. Iago and Buenos Ayres.

Of the buoys, the first on the Ortiz (black) was laid on its N. E. extremity at about 40 miles S. W. by W. ¼ W. (W. S. W. ⅓ W.) from Monte Video, and 15 miles N. N. E. from Point Indio. It is described as lying in latitude 35° 6′ 30″ S. in 2¾ fathoms, 5½ miles E. S. E. from an old beacon or wreck on the sand, visible at low water; the second buoy bears N. W. ¾ W., 20½ miles from that on its S. E. end, and N. E., 8 miles from the buoy on the S. E. end of the Chico; the fourth bears N. by E., 6 miles from the buoy on the N. W. end of the Chico; the third to the N. N. E. of the third on the central part of the Chico, all in 3 fathoms. These buoys mark the large channel between the banks of 4, 5½, and sometimes 6 fathoms, according to the state of the river.

Of the buoys, the first on the Chico (red) lies about 23 miles W. N. W. ½ W. (N. W. by W. ½ W.) from that on the S. E. end of the Ortiz, in 3 fathoms, muddy bottom, with the Magdalena church bearing S. 15° W. 11 miles distant; the second buoy is laid four miles W. N. W. from the first, or S. E. buoy, in 2½ fathoms; the third N. 15° W. of the second, in the depth of one fathom and a quarter; the last, or N. W. buoy, lies over a muddy bottom, with Atalaya point bearing S. 24° W., nearly 10 miles.

The black buoy on the Ensenada spit lies in 3 fathoms, with Point S. Iago bearing S. 28° E., and Point Lara S. 53° W.; that on the bank of Lara lies with Point Lava, bearing S. E. ¼ S. and Point S. Iago S. 63° E. in the same depth, and at about three miles from shore.

Captain Barral, of the French Navy, gives the following description of, and directions for, the Rio de la Plata.

"The Rio de la Plata is supplied from the west by the waters of the Uruguay and Parana, two great rivers, which themselves receive the waters of a great number of subsidiary streams.

"Three towns of the republic of Uruguay stand on the north side of the river; the first in coming from Santa Maria, is *Maldonado*, already described; the second, *Monte Video;* and the third, *Colonia del Sacrimento.* The chief, or capital, is the city of *S. Felipe*, or *Monte Video.*

"*Buenos Ayres*, the only town on the south side of the river, is the capital of the United Provinces of *La Plata.* Its distance from the river Parana is five leagues. From Cape Sta. Maria to Maldonado the distance is 16 leagues; from Maldonado to Monte Video, 21 leagues; and from the last to Colonia, 31 leagues; from Cape S. Antonio to Buenos Ayres the distance is 45 leagues.

"Near the north shore are several isles, and a number of rocks both above and under water. These isles on Lobos, 8 miles to the south-eastward of Maldonado; Gorritti in the bay of Maldonado; Flores, having the lighthouse before noticed, 15 miles to the eastward of Monte Video; the islets of San Gabriel, Farallon, and Lopez, before Colonia and those of Hornos, at a league and a half to the N. W. from that town. The rocks are all within a short distance from the land.

"WINDS. At the entrance of the river, and at Monte Video, the most prevalent winds are the N. E. and S. W.; at Buenos Ayres and at La Colonia the prevailing winds are from N., N. W., S. E., and S. W. During summer, when the weather is fine, the winds blow over all the river pretty regularly, from the E. to S. E. after six in the morning to sunset. In the night the winds vary to the north.

"S. W. and S. S. W. winds are known in the Plata under the name of Pamperos, as coming from the Pampas, or plains, over which they pass. They clear the sky, and commonly blow after rain, or when the wind has varied from the N. to N. W. and to W., and in the summer, after a calm and very hot day. Sometimes the Pampero comes on after a strong N. E. wind, while the sun is obscured by clouds, when it is sudden and very dangerous. It thus meets the ships which are found in the Plata, or near the entrance, and is indicated by a sudden fall in the barometer, which rises afterward.

"As it rains more frequently in the winter than in the summer, this wind is more common in the rough season, and then lasts for two or three days. In summer it grows stronger, but generally ceases sooner. It is then designated in the country tarbonada, equivalent to the French word tourmente, and to the English storm.

"When the weather is fine, with the wind light and constant, the tides are regular on the shores; but when there is any perturbation in the direction and force of the winds the tides become irregular, and form currents, which frequently acquire a velocity of 4 and 5 miles an hour.

"At Buenos Ayres the sea is high with winds from S. E., and low with winds from N. W. and S. W.; at Monte Video, and on the rest of the north shore, the waters rise with S. E. and S. W. winds, and fall with northerly ones. The difference of level on the two shores rarely exceeds four or five feet, but in strong N. W. gales the rise is, at times, ten feet.

"In the months of March, April, and a part of May, the river is higher than in the other months of the year, being raised by the increase of the waters of the Parana and Uruguay, which bring down, at that time, trees and bushes from the verdant islets of the river. This is the finest season of this part of South America, with the winds moderate and temperature agreeable. During the spring, summer, and winter, the winds are almost constantly strong, and the temperature of the air very agreeable.

"ANCHORAGES. Whenever the lead indicates ooze or muddy ground you may drop an anchor, only taking care to be at a sufficient distance from the bank, and so as not to drive upward. With the winds in the southern quarter the anchorages on the south side is the best; but with northerly winds the opposite side is to be preferred.

"Ships of war and large frigates may ascend to Monte Video; all ships drawing 16 or 17 feet water may safely proceed to Buenos Ayres on the one side, and to the Hornos islets on the other. The anchorages, sheltered from N. W., N. E., East, and S. E. winds, are Maldonado, Monte Video, and Hornos. Those sheltered from the S. W. are the Ensenada de Barragan and Buenos Ayres.

"Small ships may also anchor at the entrance of the river of Santa Lucia, and at Colonia on the north coast, at the Rio Salado in the Ensenada de San Boromber, and at Riachuelo, near Buenos Ayres, on the south side.

"You may anchor at Maldonado in 6 or 7 fathoms of water; at Monte Video, in the road, in 5 fathoms; in the harbour in 3 and 3¼; at the Isles Hornos in 3½ or 4 fathoms; in the road of the Ensenada de S. Borombor in 4 fathoms; near Buenos Ayres, in the road, in 3½ or 4 fathoms; and near the town in 2 and 2½ fathoms.

"In the anchorages of the north coast you ought to moor during S. W. winds, and in the others with the winds south-easterly. Of all the ports and roads the best holding ground is at Maldonado; this is ooze covered with sand; elsewhere the bottom is of soft mud, on which the anchors drag in gales of wind. During the Pamperos the Isles de Hornos present very good anchorage, the sea before them being broken by the bank of Palmos.

"DEPTHS OF THE RIVER AT THE ENTRANCE, AND IN THE OFFING. When you have gained the parallel of Cape Santa Maria, and longitude 51° 54′ W., the depth, at the distance of 33 leagues from the cape, is 80 fathoms, bottom of ooze; at 25 leagues the bottom is of sand, or of ooze mixed with shells, and the depths only 35 to 25 fathoms; on advancing nearer to the cape the decrease in depth is irregular. On the parallel of Castillos 34° 24½′, at 33 leagues off, the depth of water is 52 fathoms, and the predominating quality of the bottom is of sand. In navigating on the parallel more to the south, or that of Cape Santa Maria, less water will be found in the same longitude, and the depths gradually diminish.

"At 15 leagues from Cape St. Antonio is a depth of 15 fathoms, sand; at 28 leagues from the same cape, to the S. E., are 40 fathoms, similar bottom. To the north of the cape, at 5 leagues from the land, are 6 and 7 fathoms; and in the direction of the English bank, on the parallel of 35° 11′, are 5 and 6 fathoms, with sandy bottom, at 5 leagues, without the same, near the meridian of 55° 35′.

"*When turning in*, on the parallel of 35° 20′, and having attained the same meridian, the bottom has been found of fine sand, the lead indicating about 7 fathoms of water. On the parallel of 35° 35′, and thence to Cape S. Antonio, the bottom is of sand, mixed with shells or gravel.

"From the latitude of 35° 20′ S., having passed the meridian of the English bank, the depth does not increase to more than 7 fathoms; on the parallel of 36° it attains 10 and 11 fathoms. To the west of the bank, on this parallel, are five and 5½ fathoms only. At twenty leagues off, from the entrance of the Rio de la Plata, the water loses its blue colour, and assumes that of green tinged with yellow.

"On running for the north shore, when in view of it, or near the land, the quality of the bottom will be ooze. When running on a parallel, a little higher than that of the Isle of Lobos, on the north of this isle, ooze will also be found; at two miles south of it are 14 and 14½ fathoms of water, and at 6 miles, 20 and 21 fathoms. From Lobos, westward, toward Monte

Video, the depths of water diminish gradually, but irregularly. In the passes, formed by the banks of hard sand, situate between Monte Video and Buenos Ayres, are 3½ to 5 fathoms of water."

NAVIGATION AT THE ENTRANCE AND IN THE RIVER. The preceding description indicates the precautions requisite to be taken on approaching the different points of the entrance. On advancing it is prudent to prefer the north coast, that only being elevated.

Some navigators have pretended that they can always judge of their position without a view of the land, by the depths of the sea, and an inspection of the divers qualities of ground gained by the lead; but this must be incorrect, for, in exploring the offing on all these coasts, soundings were frequently found similar to those off the river, and the resemblance, if depended on, may cause dangerous errors. We, therefore, advise mariners not to attempt making the river without being previously well assured of their position by observation of latitude and longitude, and always to advance with precaution, on account of currents, which may happen to prevail between the hours of observation.

If the wind be steady from N. E. when you approach Cape Santa Maria, that will be an advantage which will allow you to reconnoitre a greater extent of coast before entering the river; but under other circumstances a sight of Lobos is, in the first instance, to be preferred, as you may thus avoid being wind-bound on the north coast, and have a better chance of plying to windward. It has been already noticed that the landfall of Cape Antonio is both difficult to make out and dangerous to approach, unless in favourable weather.

Having arrived to the southward of the Isle Lobos, at the distance of two or three miles, the direct course for the isle and lighthouse of Flores will be W. 7° N., true, or W. ½ S., by compass; but as the Plata is subject to very variable currents, such must be allowed for on approaching the north shore, taking care, at the same time, not to fall too far to the southward, or toward the English bank. On approaching land you may, in good time, see the round tower of Maldonado, and the high lands to the westward; and in continuing the route, at the distance of 5 or 6 miles off, distinguish a point formed of black rocks, with beaches of sand to the right and left of it. This point, called *Punta Negra*, (Black point) is situated at 14 miles westward of Maldonado; it is the western point of a great sandy bay, over which the high lands are remarkable, as appearing to rise like a great white border from the shore of Maldonado, and the extreme points of the bay *Ballena and Negra.*

When you are on the meridian of Punta Negra, at the distance of six miles, the isle of Flores will again bear W. 7° N., *true*, or W. ½ S. by compass. Here you will have 11 or 12 fathoms of water, oozy bottom, and may thence proceed with perfect safety.

Beyond the lands situate to the north of Punta Negra, the coast makes a break or aperture, and thence becomes very low. On steering in sight of land, you may now distinguish the *hills of Afilar*, situate in latitude 34° 47′ 15″ S., and longitude 55° 26′ 15″ W.; when these bear N. by W. (by compass) and the nearest hill of Punta Negra bears N. E., you will be 27 miles eastward of Flores, in 11 or 12 fathoms of water, oozy bottom, and the isle in a line with Lobos. The hills of Afilar are insulated, and resemble two mamelors, or tetas, or paps.

On proceeding upon a course W. ½ S. as above, you may see, from the mast-head, the light-tower on Flores, at the distance of about 12 miles. This isle, when first described, resembles three islets; afterward the lower part gradually rises from the horizon, and at five miles off the whole comes in sight. When the sea is high, the isle when first seen, appears in two portions only.

On coming in by night, you may see the revolving light on Flores, directly ahead, and may approach it to the distance of four miles, then passing it to the southward at two or three miles. Between Flores and the English bank the bottom is of ooze, and the general depth 6 and 7 fathoms. The distance between is ten miles.

From the isles Flores to the harbour of Monte Video the distance, in a right line, is 16 miles W. by S., which will lead clear of the *Punta Brava*, 4 miles to the eastward of that port. This Punta Brava is formed by a line of rocks projecting into the sea; one shoal, detached from the rest, requires a berth on passing. A large white house stands to the north of the point, and a smaller one is situate toward the middle of the rocks.

On leaving Flores, when the weather is clear, the Cerro or hill of Monte Video comes in sight; and, in some time after, the steeples or towers of the cathedral in the city will be seen.

With the wind from the N. or the N. E., you may steer by night to the W. by S. for doubling Point Brava; but with the winds from the S. E. or E. S. E. it will be prudent to steer W. S. W. You ought, in precaution, either in one case or the other, to keep the light on Flores E. by N. or E. N. E., with an assurance that the currents will not set the ship in the direction of Point Brava.

When the Cerro or hill called Monte Video bears N. W. the point will be doubled, and you may proceed on the starboard tack, so as to gain the anchorage. A large vessel, after passing Brava, may proceed W. by S., and find anchorage in the Great Road in 5 fathoms. At a mile to the south of Point Brava are 5 fathoms of water.

In the track from Lobos to Monte Video, as in all those in the interior of the river the rate of way must be measured by the log, and the current by a boat, in the usual manner, so as to ascertain whether it be in favour of the ship or otherwise. The route will be modified accordingly.

As all the coast between Punta Negra and Flores may be approached to the distance of 5 or 6 miles, it is best by night to make the tacks on the starboard side. The revolving light of Flores will, in this case, be clearly seen, and you may pass to the southward of it, leaving it at the distance of 4 or 5 miles, which will lead, at a sufficient distance from the English bank in 6 and 7 fathoms.

The Cerro, or Hill of Monte Video, is 478 feet high above the level of the sea. On it is established a fixed light, but which cannot be seen by night, more than 5 or 6 miles off, when the weather is clear.

Should you attempt to make Monte Video, by passing to the southward of the English bank, you must pass this shoal, from the entrance of the river on the parallel of 35° 30′, steering W. by S. with northerly winds, and W. S. W. with the wind southerly.

On passing over the great bank the soundings will be fine sand, then ordinary sand, afterward oozy sand, and lastly ooze, when over the bank, and on the meridian of Monte Video. You will then, by steering north, gain sight of the mountain, which may be seen by day, in clear weather, nine leagues off. Its position is latitude 34° 53′ 2″ S., in longitude 56° 11′ 37″ W.

If, notwithstanding the precautions indicated, you fall on a bottom of 5 fathoms, in passing to the southward of the English bank, by tacking to the N. W. you will soon after gain from 6 to 8 fathoms. In thick weather, or if the true situation of the ship be uncertain, in any part of the river you may always anchor rather than continue your route.

MONTE VIDEO. THE BAY OF MONTE VIDEO is 2½ miles in extent, and its general depths are from 15 to 9 feet of water. The city, named that of SAN FELIPE, or ST. PHILIP, is on the eastern side, as shown on the particular plan of the harbour, and stands on a peninsula; it is strongly fortified, and has a citadel on the east. This place is the capital of the republic of URUGUAY, formerly called the *Banda Oriental.* The population is estimated at about 10,000. A British consul is resident here. The anchoring ground is good, but exposed to the *pamperos*, or S. W. winds, which, at times, raise the water 6 or 7 feet above the ordinary level. On the western side is the hill from which the harbour derives its name, and on which stands the lighthouse; the other part of the coast is low.

The best anchorage has been already described, and therefore have only to add that there is a shoal in the eastern part of the bay, called EL BAJO DE LA FAMILIA, and lying at nine-tenths of a mile N. by E. from the extremity of the eastern point, called that of SAN JOSE, on which likewise there are several rocks. The depths between are from 15 to 9 feet.

SECTION IX.

THE COASTS OF LA PLATA AND PATAGONIA,

INCLUDING

THE STRAIT OF MAGALHAEN.*

FROM the river Plate to the Rio Negro, or Black river, the coast is entirely flat and destitute of harbours. The interior is one vast plain, mostly covered with grass and clover, Captain Fitzroy says, "As pasture land it is excellent, except in the summer, when all is parched. There is a rich tract of country between Buenos Ayres and Cape Corrientes, where the soil is rich and the water plentiful. In that tract there are ranges of low hills, extending nearly east and west. From Blanco bay to the river Negro the coast is dangerous; the land is everywhere low, the shoals numerous and extensive, and the tides strong. In Blanco bay, the best harbour hereabout, the tide rises from 8 to 12 feet; this is the only known asylum for large ships; but good water is here extremely scarce, and wood is not obtainable, unless from a great distance. All this country is exposed to severe cold in winter, and to excessive heat in summer; great and sudden changes of temperature take place when, after very hot weather, cold winds rush northward with the fury of a hurricane. Even the wandering Indians avoid this region, and cross it only to get salt, or visit their burying places.

Captain Morrell, in describing the coast to the southward of the river Colorado, says, "On the 20th of September, 1822, we were close in with the bay of All-Saints, in latitude 40° 30′ S., but did not stop to examine it, being anxious to enter Rio Negro on the following day. To the southward of Rio Colorado, or Red river, the coast is gemmed with islands, and abounds with shoals, extending a league to the eastward. Among these islands and shoals are many good and safe harbours, for vessels under 300 tons burthen.

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* Nearly the entire of this section is taken from Captain P. P. King's Sailing Directions for the Coasts of Eastern and Western Patagonia. Printed for the Hydrographical Office, Admiralty, 1832.

"Rio Negro. About 12 leagues south and west of these islands is *Rio Negro*, in which we cast anchor on the 21st, our vessel being the first from the United States that ever entered this river. Previous to this visit of the *Wasp* Rio Negro had been of very little note; but it is now much frequented, especially by whalers, who touch here for refreshments. Here we found bullocks, sheep, hogs, and poultry in abundance; and, in the summer or winter, (say from March to June) any quantity of vegetables and many different kinds of fruit may be had at this place, on a brief notice, and at a very low rate. Good water can be drawn alongside at the last of the ebb, and wood, in any quantity, may be cut by the ship's crew close to the banks of the river. The inhabitants are principally Spaniards, who are very friendly to strangers, with whom they are anxious to open a trade.

"In coming from the eastward, for Rio Negro, the navigator should endeavour to make the land in about the parallel of 40° 52′ S., and longitude 62° 15′ W., when he will first see Point Rasa, which will be readily known by three remarkable hummocks. After approaching to within about one league of this point he has to steer S. W. toward Rio Negro, taking care not to come into less than 6 or 8 fathoms of water, with a sandy bottom. The shore is a continuation of low sand-hills, interspersed with heath and brushwood, until you approach the river, where the hillocks become more elevated, and are composed of clear white sand, lying in ridges or undulations like the waves of the ocean. About 4 or 5 miles south of Point Rasa is a singular hillock of brushwood, having small shrubs toward the east end, which, from the sea, appear like a drove of cattle. Eight miles to the south and west of this is a remarkable gap, about 2½ miles back of the beach. As you approach the entrance of Rio Negro the range of white sand-hills will terminate, and the mouth of the river, bearing W. S. W., appears high and bluff, on the eastern side. The western point of the river is low, but rises gradually to the south barranca, which is high and bluff, terminating in a perpendicular point; and this point is a table land for 4 or 5 miles to the westward.

"In entering Rio Negro, without a pilot, the S. E. channel is to be preferred, and you must keep along in 4, 5, or 6 fathoms of water, until you bring Point de Maine, the eastern point of the river, to bear N. W.; then steer for the mouth of the river, observing to keep Point Welcome, which is a remarkable bluff promontory, about 10 yards open of a low point off the pilot's house. These marks are distinctly seen when Point de Maine bears N. W.; but in entering beware of the flood tide, which sets strongly over the north bank; and, if your vessel draws more than 10 feet of water, you must not attempt to enter until three-quarters flood, when you will have from 2 to 2½ fathoms of water, between the banks, which will deepen as you approach Point de Maine. The breakers on the bank are distinctly seen, and, with a southerly wind, it frequently breaks all about the channel. Having passed through between the north and south banks, you will find 4, 5, and 6 fathoms of water; but you must be careful and keep the eastern point on board until you are inside of the point of the Borras, by which means you will clear the inner bank, extending two-thirds of its length outside the harbour's mouth.

"In this river, at the town, are about two hours of flood tide, and commonly about 10 hours of ebb, frequently running at the rate of 5 or 6 miles an hour. But within the mouth of the river the flood tide runs four hours, and the ebb eight hours, at the rate of 3 or 3½ miles an hour. It is high water at the bar, on the days of new and full moon, at 11 h. 15 m., and the water there rises 11 feet on the spring tides, and 8 feet on the neaps;

but, when the wind blows strongly from the S. E., the tide rises from 12 to 14 feet. Along the coast is a regular tide of six hours flood and six hours ebb, but the flood tide inclines rather toward the shore, about N. E. by N., at the rate of 2 or 3 miles an hour. Consequently, in entering Rio Negro, particular attention must be paid to the currents and tides, which set strongly to the N. E., round the Point de Maine, or outer point."

ST. MATTHIAS BAY. From Rio Negro the coast for nearly 30 leagues trends westerly, whence it sweeps south-easterly in a broad semicircle, terminating in a peninsula which projects to the N. E., thus forming the extensive bay of St. Matthias. On the western side of this bay, somewhat inland, rises the mount of St. Antonio, and in the N. W. corner is a port of the same name, said to be a fine harbour, and very convenient for whaling ships, though but little frequented; its entrance is very narrow, between banks on either side. The S. E. part of the bay is formed by a peninsula, St. Joseph's, within which, on the N. W., is the gulf of St. Joseph; and on the S. W. side of the peninsula is the Bahia Nueva, or New bay,—the neck of the peninsula extending between them. On the eastern side of the peninsula is port Valdez, in latitude 42° 30′ S.

Bahia Nueva, or New Bay, is an excellent place for ships in want of refreshments, which may readily be obtained. Whale ships having good ground tackling may lie in any part of the bay, in perfect safety. The best anchorage is on the west side, in from 5 to 10 fathoms, at about a mile off shore, as in this part easterly winds seldom, if ever, blow with sufficient violence to injure any ship lying with an anchor ahead. On the 25th of September, 1822, Captain Morrell, in the *Wasp*, anchored on the south side of this bay, in 5 fathoms, about 3 miles within the Punta Niufas, or South point. On landing, grey foxes, brown hares, and mountain deer in great numbers were seen. Several cow-whales, of a large size, were at the same time in the bay, and perfectly tame. On the next day, upon landing on the north side of the bay, on the plains of the peninsula, about 3,000 wild bullocks were seen, of which four of the finest were taken. At the head of the bay were found vast forests of heavy timber, some of which would make fine spars for ships of any size, being a kind of bastard cedar, which is very tough, and when dry becomes extremely light. There were, also, many fine springs of excellent water, and numerous birds of beautiful plumage. The waters abound with scale fish of almost every variety.

Port Santa Elena is a small bay quite open to the south; and near the middle of the entrance, which is only a mile and three-quarters wide, is a small shoal of twelve feet; and at two cables *true* east from it is a low islet, named Florido. The best passage in is to the W. and N. W. of these, where there will be found 10 to 7 and 6 fathoms of water, in the N. W. cove of the harbour. The bay affords good shelter from S. by E. westward to E. by S., and, as the heavy and prevailing winds are between these points, this place may well be recommended to stop at for a few days. The winds are seldom from S. E., and generally light; and, the tide running strong across the entrance of the bay, the sea, during strong S. E. winds, is much cut off.

Captain King says, "This harbour may be easily known by some hummocky hills on the N. E. projecting point, on the eastern of which is a remarkable stone that appears to have been placed there as a monumental record, but which is a natural production. The best anchorage is at the N. W. corner of the bay, in 6 or 7 fathoms, but not too near to the shore; for, when the sea is heavy, the ground-swell breaks for some distance off. In working into the bay, the two-fathom bank must be avoided, for which Florido islet is a good mark.

"The water that is contained in the two wells on the N. W side of the harbour is too brackish to be worth consideration, nor is there any fresh water to be obtained from any part of the harbour. Of fuel a temporary supply may be procured from the small shrubby tree, bearing a yellow flower, with a prickle at the extremity of every leaf; the sealers call it *piccolo*, from the small dimensions of its stem: it is tolerably abundant here. Guanacoes, ostriches, armadillos, and the cavia, or Patagonian hare are to be procured, as are also wild ducks, partridges, snipes, and rails; but fish seem to be scarce. The Indians sometimes visit this part of the coast, which is used by them principally for burying their dead.

"In approaching port St. Elena, from the northward, there are several rocks near the shore which are very little above the water, and there is a considerable reef in the offing, situated 4¼ miles S. 78° E. from Cape Raso, and N. 51° E. 8 miles from the N. E. trend of the north head of the port. It is a dry rock, and is near the extremity of a ridge which, probably, projects off from the latter point, for there are two dry rocks in the same line of bearing, one a mile and a half, and the other three and one-third from the point, besides several patches which break. The tide sets rather strong along the shore, which is fronted by reefs for 2 or 3 miles off; great caution should therefore be used in approaching the coast, as the water is deep, and, if becalmed, it may be necessary to anchor, which will be in at least 30 fathoms water.

"Should the above reef be as continuous as it appears, there should be good riding in the bay between Cape Raso and port St. Elena. Between the south head of port St. Elena and Cape Two Bays are two bights in the coast, the southernmost of which is considerable, and may probably afford a good anchorage.

"CAPE TWO BAYS is a rounded point, the hill close to the sea, on the most projecting part of the cape, being in latitude 44° 58′ S.; the small islet of *Arce*, to the S. E., is in latitude 45° 0′ 50″ S., and longitude 65° 25′ 25″ W.; and *Raso island* is in latitude 45° 6′ 30″ S., longitude 65° 20′ 11″ W. From Cape Two Bays the coast trends westerly round Cape Two Bays, and forms the northern part of St. George's gulf."

Captain Morrell says "CAPE TWO BAYS, as its name imports, is a projecting point between two bays, forming the south part of Camarones bay, and the north part of the great bay of St. George. About the shores of the last named bay are numerous rocks and isles, containing seal of both kinds, and behind some of which vessels may anchor in safety. Puerto de Melo, or Port Melo, in latitude 45° 3′ S., longitude 66° 56′ W., is the first safe harbour to be found after entering St. George's bay on the north side It is fronted by the *Escobar* and *Leguma islets*, and ships of any size may lie within it, in perfect safety, in from 7 to 5 fathoms, sandy bottom. The entering passage is between the Escobar islets and the eastern point, *Punta de Portugal*; at about a mile within this point the water has a depth of 5 or 6 fathoms. In this snug and safe harbour, at the head of the bay, vessels may obtain good fresh water, but wood cannot be obtained without difficulty. The tide rises about 18 feet; high water, full and change at 4h. 22m. PORT MALASPINA, in or about latitude 45° 12′ S. longitude 66° 39′ W., is fronted by the Viana islets, or rocks, behind which vessels may find shelter from every wind, the S. E. excepted. In approaching this small bay you will see the *Tetas*, or *Paps of Pineda* to the north, abreast of which you may anchor in from 10 to 6 fathoms of water, fine sandy ground.

"There are many other good anchoring places between this and Cape

Blanco, the southern extremity of St. George's bay which require no particular directions, as the coast is bold and clear of danger, within half a mile of the shore. Easterly winds never blow here with any degree of violence, so that whalemen may cruise about these shores, in the calfing season, with the greatest safety."

Cape Three Points. The southern limit of St. George's gulf, *Cape Three Points*, is very easily discovered at sea by its very level outline, being a long range of table land higher than any part near it, visible from the deck for more than 20 miles; and to the S. E. detached, but near the range, there is a conical hill, which is easily discerned from the northward, but from the N. E. is not seen, being concealed by the ranges of land behind it in the S. W.

Cape Blanco. At six miles and a half to the S. E. of Cape Three points is Cape Blanco, a low rugged tongue of land, terminated by a rounded but very rugged hillock and two smaller ones, which, when first seen, appear to be islands detached from the coast. The neck of land, which forms the communication with the coast is low and sandy, and probably offers, on its side, shelter from southerly winds. There are several shoals off this part of the coast, that at low water would doubtless be dangerous. H. M. S., Adventure, passed over two, and had not less than 5 fathoms, but probably at low water the depth may be considerably less; they are thrown up by the force of the tide, which sweeps round the cape, into and out of St. George's gulf, with great strength.

The north and south ends of the northern shoal bear respectively from Cape Three Points and Cape Blanco E. N. E. ¼ E. (East) distant from the former 7 miles, and from the latter 5 miles; consequently it extends in a N. 31° W. (N. by W. and S. by E.) direction for 5½ miles; it is scarcely a quarter of a mile wide. The north end of the southern shoal bears E. 5° N. (S. 75° E.) 7 miles from Cape Blanco, and extends in nearly a *true* south direction for 2 miles. Between these shoals there is a passage two miles wide, and the depth gradually increases to more than 15 fathoms.

Within the outer shoals are two others, imperfectly known, and it is said there is much shoal ground to the N. E., for, in the year 1829, Captain King having approached the land, and being 14 miles from Cape Three Points, bearing S. 38° W. (magnetic) the depth rather suddenly decreased from 40 to 14 fathoms, pebbly bottom, so that the foul ground extends for 14 or 15 miles to the N. E. of the cape, the edge of the bank being about 8 or 10 miles within the soundings of 50 fathoms. On approaching it the quality of the bottom becomes irregular, and changes from ooze to sand, and the shoal patches are pebbly, so that by attention to the soundings, and nature of the bottom, these shoals may be easily avoided. A good mark to avoid them is not to approach so near to the cape as to see the rugged hillock of Cape Blanco, and to keep the high land of Cape Three Points, which is visible from the deck about 20 miles, on the horizon.

The flood, or northerly tide, ceased in the offing at 4 h. 15 m. after the moon's passage; but in the neighbourhood of the cape, and among the shoals, the tides may be less regular; they produce strong ripplings, and set with considerable strength.

Off the coast, between Cape Blanco, and Port Desire, within the distance of 3 to 5 miles from the shore, there are several small patches of rock, which uncover at half-tide; but beyond that belt the coast is free from any known danger, and may be approached, by sounding, in not less than 14 or 15 fathoms: within that limit the ground is foul. To the northward of Port Desire the land is low, with a shingle beach, excepting for the first 3 miles, where it is high and cliffy. The north point of entrance of the bay is a steep bluff, which is remarkable in being the only point of that description along the coast to the northward. At 3 miles N. 28° E., *magnetic*, from this bluff there is a ledge of rocks, *Surrel ledge*, a quarter of a mile without which the depth is 13 fathoms. The *Tower rock* becomes visible after passing this ledge; it opens out when the north bluff bears S. W. ½ W. A ship bound to Port Desire, or merely wishing to anchor in the bay which fronts it, may procure a good berth in 6¾ fathoms, at low water, well sheltered from N. ¾ W. to S. E. ½ E., with the north bluff bearing N. W. ¼ W.; the Tower rock W. ¾ N.; and Penguin isle S. E. ½ E.

This situation being a little to the southward of the fair-way of the port, and about 1½ mile from the nearest shore is quite out of the strength of the tide; the bottom, being strewed with rounded stones, is rather foul for hemp cables, but the holding ground, although of such suspicious quality, seemed to be good: at this place the tide rose from 6¾ to 9½ fathoms, a difference of 16½ feet.

Port Desire. The river of Port Desire has rather a difficult entrance, from the strength of the tide and its narrow width; and it is rendered still more confined, from several rocky reefs, that extend off the north shore to nearly mid-channel. There is good anchorage off the mouth; by waiting, therefore, for low water, all the dangers that exist will be seen, and the vessel easily dropt in with the tide, should the wind be, as it generally is, westerly; if it be fair, it is advisable for the ship to be in the entrance at slack water, or, if the breeze be strong enough, a little before. As the water is deep on the south shore, there seems to be no real danger that may not be avoided by a careful look-out for kelp, which always grows upon, and therefore plainly indicates the existence of rocky ground. The course in is about W. S. W. ¾ W., and the distance from the entrance to the anchorage is one mile and a half. The anchorage is off the ruins* on the north shore, and the vessel should be moored: the tide sets in and out regularly.

The river was examined for 16 miles, but is probably navigable to a much greater distance. Four miles above the ruins there is a small peninsula, connected by a narrow isthmus to the north shore; by sending a party up, and stationing men with guns on the isthmus, it is very likely that several guanacoes may be shot as they are driven across it, for the peninsula is their favourite place to feed upon. These animals are very abundant, but unless stratagem be used, they are very difficult, from their shyness, to be approached. There are some water holes near the ruins, which generally contain water, but of so brackish a quality as scarcely to be worth notice. The wood is of the same kind as that found at port Santa Elena; it burns well, and is much prized by sealers for that quality.

Captain Morrell, in describing Port Desire, says, " It is the seaport of a large river; the mouth is very narrow, and has many rocks and shoals about it. It continues to be narrow for about 2½ miles from the entrance, when it expands into a broad basin, sprinkled with a number of small islands frequented by seals. Near the mouth of this port, on the south side of its entrance, is a remarkable rock, rising from the water like a church steeple of Gothic order, and is known by the appropriate appellation of *Steeple rock*. This rock forms a conspicuous landmark for mariners who are approaching the harbour, which would otherwise be difficult to find. There are two springs on the south side of the river, about two miles from the beach, or in a line S. S. E. (true?) from Steeple rock, from which water of a good quality can be obtained in abundance. The tides are very rapid about this part of the coast, running at the rate of 8 miles an hour, nearly north and south, and rising 25 feet at each flood."

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* Some years since a Spanish colony was founded at Port Desire, but, not answering the purpose, it was soon afterwards given up. The ruins of the edifices, which are of stone, and the remains of a fruit garden, that at our visit produced quinces and cherries, distinctly point out the spot. *Captain King.*

Penguin Island. The outer side of this little island is bold, and may be passed very close without danger, for the tide rather sets off than towards the shore. The tide is very rapid, and forms, even in a calm, strong ripplings, which, in a breeze, must be very dangerous for boats to pass through, and, indeed, not agreeable for vessels of any size. The flood sets to the northward, and, during its strength, at more than 3 knots; for we found the ebb to have set us 15 miles to the south, in 5 hours. Off the island the high water, or the termination of the northerly stream, takes place at about 4 h., or 4 h. 15 m. after the moon's passage, which is $3\frac{1}{2}$ or 4 hours, at least, after it is high water at the shore.

Sea Bear Bay, according to Captain King, is one of the best anchorages that I know of on the coast, but is difficult of access, without a leading and a fresh wind, on account of the strength of the tides, which set to the northward through the narrow channels, separating the rocky islets that are strewed between Penguin island and the main land. The bottom, besides, is not only deep, 23 to 30 fathoms, but is very foul and rocky; and although a ship may be prevented from drifting through by dropping an anchor, yet its loss, from the foulness of the ground, would be almost certain. In entering the bay, border pretty close to the low rocky point to the southward, to avoid a reef that lies about a quarter of a mile without it; but, as the sea always breaks upon it, the eye, and a due consideration of the tide are the best guides. This reef extends for some distance to the eastward of the breakers, and, therefore, the tides, when within it, sets in or out of the bay, but with little strength. Should a ship not be able to enter the bay, there is anchorage off the point between it and the reef, on, I believe, tolerably clean ground. You will have 12 or 13 fathoms, off the reef, then the depth shoals for one or two heaves to 7 fathoms, after which it deepens again; you may then haul across the bay, and anchor at about a quarter of a mile within the low rocky point, bearing E. $\frac{1}{4}$ N. or E. by N., by compass, in 4 fathoms low water, avoiding the kelp which projects off from the sandy beaches. A small vessel may easily turn in, but I should hesitate taking such a step in one that I could not make quite certain of. When once in the anchorage is good, and protected at all points, except between N. 41° and N. 78° $\frac{1}{2}$ E., but from the appearance of the beaches I do not think a heavy sea is ever thrown into it.

There is no wood to be procured of any size, and the few gallons of water that are collected in the wells at the point, so very precarious as to be scarcely worth attention. The passage to the watering holes is over a small rocky bar, which a boat may cross at three-quarters flood; it is immediately within the eastern point of the bay; there is a small spring at the north end of the third sandy beach, which a herd of guanacoes was observed to visit every morning; but as the water only trickles down in a very small quantity, it cannot afford more than a temporary supply. Two of the three wells at the point we found to be full of sea water, which had breached over the rocks; the other contained about 40 gallons of rather a brackish taste. Besides a good and secure anchorage this place affords no other advantages; it is convenient for sealing vessels to anchor in whilst employed in their occupation upon Penguin island. Sea Bear Bay is in latitude 47° 56′ 49″ S. and longitude 65° 44″ W., variation 20°: high water, at full and change, at 12h. 45′, and the tide rises 20 feet.

Ferrer, or Spyring Bay is contained between the south head of Sea Bear bay and the point within the Shag rock; it forms a considerable bight, but is much exposed, being quite open to the south and east, and at the conclusion of a S. W. gale, when the wind always veers to S. and S. by E., there is a considerable sea. The shore is skirted, for some distance off, with many rocks, and the bay, altogether, is quite unfit for anchorage. The land is of the same height as about Sea Bear bay, but has more lumps or nobules of rocky hills, visible on the outline of its summit.

The *Ferrer* or *Shag rock* is a whiteish mass of rock, perfectly bare, lying about one mile and a half off shore; two miles to the south of it are four small dark coloured rocks, and at three miles, S. S. W. from it, there is rather a large rocky islet. On the land, and at a short distance from the coast, are three hills, which appear, when a little to the southward of Sea Bear bay, like three round-topped hills; but on reaching more to the southward they extend in length, and form into two hills, and, at three leagues to the south of the Shag rock, they appear to form one mass of table land.

Watchman's Cape is very low, and may be distinguished by its bell-shaped mount; at two leagues from the point is a shoal with kelp upon it, on which the least water is 3 fathoms, but on approaching it the depth gradually decreases; there are also many other shoal patches, but all are buoyed with sea-weed; the ship, Adventure, passed between several in 7 and 9 fathoms. The ground is very foul and uneven for more than 4 miles from Watchman's cape; here the coast trends round to the westward, and becomes higher.

The Bellaco Rock, or San Estevan's (Stephen's) shoal, which was discovered by the Nodales, in 1619, was searched for in vain in the Descubierta and Atrevida's voyage; but, Captain Stokes, in the early part of 1828, on his voyage down the coast, found it, and had an observation of the sun close to it for the latitude; it is in latitude 48° 30′ 50″ S., and longitude 66° 9′ 25″ W. It bears S. E. by S. 10½ miles from the extremity of Watchman's cape, and S. E. from Monte Video. The rock is a dark mass, about 9 or 10 feet above the water at high tide, and has the appearance of a boat turned bottom up; within half a mile of its south side the *Beagle* sounded in 12 and 15 fathoms, rocky bottom, and on its east side, at the same distance, the depth is from 20 to 24 fathoms. The ground around it being foul and uneven the coast and its neighbourhood should be avoided. Between Watchman's cape and Port St. Julian the land is of moderate height.

The whole of the coast between Cape Blanco and Port St. Julian is much strewed with shoals, which are the more dangerous from the strength of the tides which set between them. In navigating upon this part of the coast, the depth and quality of the soundings is a good guide; and, as a general rule, when the depth is more than 40 fathoms, there exists no *known* danger. By night, in particular, regard should be paid to the tide, which sets with considerable strength, the current running parallel with the shore.

Port St. Julian. Wood's mount, in latitude 49° 14′ S., and longitude 67° 44′ W., is visible from the deck for at least 11 leagues, and is a good mark for Port St. Julian, being flat-topped and much more elevated than the land about it; the trend of the coast may also be a good mark; but, as the land about Port St. Julian is higher than to the southward or northward, and Wood's mount is so remarkable a feature, no mistake can be made; in a line with the south point of entrance the mount bears W. 16½° S. (N. 86½° W.) The north head, Cape Curioso, is a low point jutting out to the northward, formed of cliffs horizontally stratified, of which the upper part is white-brown, and the lower generally black, or with black streaks. Keeping Wood's mount bearing S. 67° W. will lead you to the south head, which will be easily distinguished when at the distance of 6 or 8 miles, or more, according to the state of the weather.

Captain Morrell has said, "It is somewhat difficult to find the entrance to Port St. Julian, on account of its southern or outer point projecting past the northern point, so as to conceal the opening. It may be known, however, by a large white cliff, stretching along shore from the south almost to the mouth of the harbour. No trees are to be seen, but there are some dark bushes on the sides of the hills. The bar, at the entrance of the port, sometimes shifts and changes its position; previous to attempting an entrance, therefore, I would recommend sending in a boat to sound. In entering the harbour the course is about S. $\frac{1}{2}$ W., and the water sufficiently deep when you are once over the bar, on which will be found, in the channel, about 4 fathoms, at full sea: the tide rises about 20 feet. Both wood and water may be obtained, but with difficulty. A ship can lie in perfect safety from all winds. The natives seldom visit the port, except for the purpose of shipping."

The land to the southward of Port St. Julian is uniform, flat, and low; it is covered by scrubby bushes, and fronted by a shingle beach. At 10 or 12 miles south of it, coming from the E. S. E., a small flat-topped hill is seen over the low coast hills.

In latitude 49° 27′ S., the character of the coast changes entirely to a range of steep white clay cliffs, the average height of which was calculated, by angular measurement, to be about 300 or 330 feet. They rise like a wall from the sea, which, at high water, nearly washes their base; but, at low water, they are fronted by a considerable extent of beach, partly of shingle and partly of mud. Some short rocky ledges, which break at half tide, lie off certain parts of this range, but none of the ledges extend for more than a mile from the shore; this cliffy range occasionally forms projections, but so slight as not to be perceived when passing abreast of them.

Anchorages along the coast may be taken up, with the wind off shore, at from a mile to two miles from the beach, in from 9 to 12 and 14 fathoms, oozy bottom. In latitude 49° 55′ S. the range of steep white cliffs begins gradually to diminish in height, and terminates, at 9 miles further to the southward in a low point, Punta Rasa, forming the northern side of the entrance of Santa Cruz river.

SANTA CRUZ. The appearance of the coast about the entrance of the river of Santa Cruz is very remarkable, and easy to be known, from the manner in which it makes when seen from the northward, and is even more conspicuous when seen from the southward. From the latter direction a coast line of cliffs and downs, of considerable height, is seen extending to the southward of the entrance, as far as the eye can reach, and terminating abruptly to the northward in a high, steep, flat-topped cliff, *Mount Entrance*, of which the upper part descends vertically; the lower slopes off, and appears to be united with some very low land, which will be seen extending (according to the distance off) two or three points of the compass to the northward of it. Mount Entrance is at the south entrance of the river, and is, by angular measurement, 356 feet high; the low land is on the northern side of the entrance of the river.

The outer part of the bar, on which, at low tide, there is 14 feet water, is nearly 4 miles E. $\frac{3}{4}$ S. (by compass) from Mount Entrance. Fourteen miles up the river, on the south bank, is *Weddel's bluff*, a conspicuous headland; and eleven miles further is another, called *Beagle bluff.* Weddel's bluff, open of the south entrance, (and in a line with the centre Sea-Lion island) bearing N. W. by W. ½ W., is the leading mark for the passage over the bar; with this mark on, and at high water, the Beagle crossed the bar, in 7½ fathoms. The Beagle bluff, a little open of the low points of the north side of the river, is also a leading mark to cross the bar.

After passing the bar, which is about a mile broad, there is no impediment to a free course up the river, keeping midway between the narrow points of entrance, until reaching the shoals which project off the east point of Sea-Lion island. The best anchorage seems to be on the south side of Sea-Lion island, where the water is shoaler, and the tide not so strong.

The shore on the S. W. side is a range of clay cliffs, of the average height of 250 feet, with grassy downs, and intersected with vallies and ravines. On the eastern side, the land, for the most part, is low and level, with a shingle beach; the aspect of the country is dreary, the soil gravelly, and the vegetation scanty,—the largest production of that nature being bushes bearing berries, none of which exceed 7 or 8 feet in height. Many brant geese and ducks were seen, as well as the common sea-fowl of these parts, such as penguins, cormorants, gulls, ducks, and divers, several ostriches also made their appearance on the beach, and traces of guanacoes were observed.

At an anchorage outside the bar, Mount Entrance bearing nearly W. by S., and Weddel's bluff W. ½ N., the Beagle rode out a gale from the S. S. W. and South, with a heavy sea, without driving. The tides, in the offing, were observed to flow very regularly 6 hours each way, but to turn 2 hours later than the time of high water in shore, the flood setting to the northward.

On the 24th January, 1824, Mr. Weddel put into Santa Cruz, and from his observations we extract the following:—"The entrance cannot be seen at any great distance, as the land which lies behind covers it, but by the latitude it may be easily found. The shore on the left or south side is high, while that on the right is quite low. On the south side is a reef of rocks, which show at low water; and on the north side is a shoal, almost dry at low water, which probably shifts. The leading mark into the river is a distant bluff,* which appears over the middle of the entrance, bearing N. W. by W. ½ W. After passing the points of the entrance, two indentations will be seen, on the south shore, and in the second one is the best anchorage, in 5 fathoms, bottom of gravel and clay. All the north side of the river is shoal, and much of it dries at low water. The tide of flood, on the coast, runs to the northward, and, in strong southerly winds, continues to run two hours after the time of high water by the shore."

Coy Inlet. Between Santa Cruz and this inlet the coast trends slightly in, and is formed by a succession of cliffs and intervening low beaches. Coy inlet is conspicuous, as it is the only part of the coast that has the appearance of one between Santa Cruz and Cape Fairweather. When within 7 miles of its latitude, 50° 57′ S., as well to the northward as to the southward of it, a ship should keep at the distance of 4 or 5 miles off the coast. There can be no inducement to go nearer, as it affords neither fuel nor water; and, if incautiously approached, much trouble and even danger may ensue, from the ledges of rocks which project, at least, 3 miles, and perhaps more, from the coast.

From Coy Inlet to Cape Fairweather the coast is similar to the northern part, but more free from rocky ledges; and good anchorage may be had from two to six miles off shore, in from 7 to 12 and 14 fathoms, muddy bottom, the water shoaling gradually to the shore. The beach is of shingle to high water mark, and then of hard clay, as far as 100 feet beyond the low water limit, where a green muddy bottom commences, and the water gradually deepens; the outer edge of the clay is bounded by a ledge of rocks, on which the sea breaks, it extends for some distance parallel with the coast.

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* Called by Captain King Weddel's bluff.

The flood sets to the N. W. by N. and the ebb S. E. by S., six hours each way; high water, at full and change, between 9 and 10 o'clock, and the tide rises 24 feet. In latitude 51° 16′ S., about 17 miles north of the cape, there is a ravine containing abundance of fresh water, which may be obtained, when the wind is off shore, without any difficulty; it is standing water, and, being much grown over with plants, may not keep, but, for a temporary supply, it seemed to be very good.

CAPE FAIRWEATHER is the south extremity of the long range of clay cliffs that extends from Coy inlet, almost without a break. The cape resembles very much Cape St. Vincent, on the coast of Spain; it also bears a very great resemblance to Cape Virgins, for which it has frequently been taken, notwithstanding there is more than 45 miles difference in the latitude of the two headlands. The cliffs are of clay, from 300 to 400 feet high, and are horizontally stratified, the strata extending for many miles without interruption. The interior is formed by open plains of undulating country, covered with grass and plants, among which is abundance of wild thyme, but entirely destitute of trees: it abounds with guanacoes, which may be procured by lying in wait for them at the water holes. Besides the pond before mentioned, there is no want for fresh water, it may be seen trickling down the face of the cliffs, at short intervals.

River Gallegos. The entrance of this river is formed, on the north side, by the cliffy land of Cape Fairweather, and on the south by a low shore, that is not visible at sea for more than 4 or 5 leagues, excepting the hills in the interior, called the *Friars*, the *Convents*, and *North-hill;* it is fronted by extensive sand-banks, most of which may be crossed at high water, but at half-ebb they are almost all dry. The entrance is round the south extremity of the shoals, which bear from the south trend of the cape S. E. by E. ½ E. (S. 43½° E.) distant 10 miles. The passage in is parallel with the coast to the southward of the entrance, taking care not to open the land to the northward of Cape Fairweather's most eastern trend, which, when in the fair-way, should bear N. 40° W. The shore on the larboard hand must then be gradually approached, and, in the present state of the knowledge we possess, the ship should be anchored to await low water, in 10 fathoms, at a mile and a half from the shore, so soon as the south point begins to be observed to trend round to the westward; the anchorage there is good, and well sheltered from the prevailing winds.

By anchoring the passage in will be easily found, and may be passed before the shoals are again covered, which will be a good guide; 4 fathoms is the depth, at low water, in the narrowest part of the channel. Anchorage may be taken up on the south side, for to the northward the banks are extensive.

There is also a middle, and as it appears to be the widest, may be the best, channel for crossing the bar; the outer part was not completely examined, but, no doubt, there is a sufficient depth of water, at three-quarters flood, for any vessel to pass it. The southern channel, however, is preferable from having the land as a guide

The river runs in to the westward for 30 miles, and then winds more southerly between two ranges of hills. Its banks are formed of downs, abounding with guanacoes and ostriches. The water is fresh at 25 miles from the mouth. In the entrance the time of high water, at full and change, is 8 h. 50 m.; the rise of tide, at the springs, is 46 feet, and the stream runs as much as 5 miles an hour.

From the south entrance of the Gallegos river the coast, towards Cape Virgins, extends in a more easterly direction than it does to the northward of Cape Fairweather; and, for the first half of the distance, is formed by a low shelving coast, that, at a few leagues from the shore, is not visible, so that a stranger might readily suppose it to be the entrance of the Strait of Magalhaens. There are, however, some marks by which it may be known, even should the latitude not have been ascertained. In clear weather, the Friars, and the other hills near them, would be visible; and, in thick weather the soundings off the cape will be an infallible guide, for, at the distance of 4 miles off, no more than 4 fathoms will be found, whereas, at that distance from Cape Virgins the depth is considerable; the bottom, also, to the north of Cape Fairweather is of mud, whilst that to the north of Cape Virgins is of gravel, or coarse sand, and the latter cape has a long low point of shingle running off it, for nearly 5 miles to the S. W.; and, lastly, if the weather be clear, the distant land of Tierra del Fuego will be visible to the S. S. W.

At 18 miles to the southward of Cape Fairweather the cliffs again commence, and continue to Cape Virgins, with only one or two breaks, in one of which, 8 miles north of the latter cape, there may be landing for a boat. There is good anchorage, generally, all along the coast, at from two to five miles off shore; but the bottom is rather stony, and may injure hempen cables. As the cape is approached, the ground becomes more foul.

STRAIT OF MAGALHAEN, commonly called the *Straits of Magellan*, was discovered by Fernando Magalhaens, in 1520; its length, in a straight line, is above 200 miles, but, if the three great bends are taken into the account, it is rather more than 300 miles. It divides the continent of South America from the South American archipelago, commonly called Tierra del Fuego. The eastern entrance is formed by Cape de las Virgines on the continent, and by Cape del Espiritu Santo, or Queen Catherine's foreland, which is on King Charles's Southland, the largest of the islands composing Tierra del Fuego. At its western entrance are Cape Pillar on the south, on the island of South Desolation, and Cape Victory on the north, on a small island belonging to Queen Adelaide's archipelago.

This strait may be considered as divided into three parts. The eastern part extends from Cape de las Virgines to Cape Negro, and its direction, as far as the first narrow, is nearly west, but afterwards to the south of west. In two places the strait contracts to a width of 5 or 6 miles, forming the two narrows, of which the eastern is called de la Esperanza, and the second that of S. Simon. The country on both sides of this part of the strait is rather level, except that, at some distance from the shore, a range of hills rises on each side to a moderate height, but with rather a precipitous ascent. No trees grow in this country; the bushes are few in number and stunted, and the grass coarse though abundant.

The central portion of the strait, from Cape Negro to Cape Froward, lies north and south, and is the widest part, extending in two large inlets, called the Useless bay and Admiralty sound, deep into King Charles's Southland. This part of the strait is the easiest to navigate, being free from islands and cliffs, except the large island of Dawson. The country on both sides rises into high mountains, especially in the neighbourhood of Cape Froward, and on the opposite coast of King Charles's Southland; some of the peaks are above the snow-line, which here occurs at about 3,500 feet above the sea level. Mount Sarmiento, on Tierra del Fuego, attains the height of 6,800 feet. Between the mountains there are valleys of some extent, which, as well as the lower part of the mountains themselves, are covered with a heavy growth of timber-trees.

The western part of the strait extends from Cape Froward to Cape Pillar, in a direction nearly S. E. and N. W. This part is very difficult to navigate on account of its narrowness, the width varying between 5 and 25 miles, and also by reason of the numberless cliffs and islets with which the shores, especially on the north side, are lined. To these disadvantages must be added the N. W. gales, which sweep with incredible force along the channel of the strait. The mountains, on each side, are not so high as along the central portion, and rarely attain the snow line; but their huge masses approach so close to the shores, that, in many places, it is difficult to find as much level ground as is required to place a boat upon. Land-locked basins, of moderate extent, however, occur in several places, and afford safe harbours. The mountains, which consist mostly of granite and greenstone, are irregularly heaped together, most of them, for two-thirds of their height, are covered with trees of a stunted growth. Two large inland salt water lakes are united with this portion of the strait. Nearly opposite the S. E. extremity of the large island of South Desolation (Fuego) a channel opens eastward into the continent; this strait, called *Jerome channel*, leads to *Otway water*, a large inland sea, 50 miles long, trending to the N. E., and separated from the eastern portion of the strait only by a narrow isthmus. From this lake another channel, called *Fitzroy channel*, 12 miles long, leads in a N. W. direction to another inland lake, called Skyring water, which is about 34 miles long and 12 wide. The country bordering these lakes on the south and west is high, rocky, and mostly covered with trees; whilst that which encloses them on the east and north is a low undulating grassy plain, without trees.

CAPE VIRGINS TO PORT FAMINE.

Cape Virgins, a steep cliff about 300 feet high, in latitude 52° 18′ 35″ S., and longitude 68° 17′ 30″ W., is the southern extremity of the Patagonian coast, and the north entrance of the Strait of Magalhaens. There is a reef extending half a mile off the point, the Adventure passed at one mile and a half from it, sounding in 8 fathoms, stones; and then, standing to the south, crossed a bank of gravel, sounding regularly in 7 fathoms, until Dungeness point bore S. W. by W., when the water deepened. In rounding the cape, unless the wind be easterly or southerly, a ship should pass within 1½ mile of the cape, and steer S. by E. until Dungeness bears S. W., then to edge away round the latter point, and afterwards the coast is clear to Cape Possession. In moderate weather, ships may anchor anywhere between Dungeness and Cape Possession, the bottom is of good holding ground, and quite clean. At from 3 to 5 miles from the coast the depth will be from 15 to 20 fathoms.

We know nothing of the Fuegian shore, or south side of the entrance. The Beagle, in beating in, made a board for 8 miles to the southward of Dungeness, and had 40 fathoms; but I believe the coast to be of shoal approach, and to be lined by a bank that is connected to the extensive reefs which project from Cape Orange.

Cape Possession is a cliffy headland on the north shore, and will be seen opening round Dungeness, on the magnetic bearing of nearly W. ¼ S.; the distance between them is 20 miles; at 10 or 12 miles to the west of Dungeness, Mount Aymond will make its appearance, bearing about W. ½ N. POSSESSION BAY extends from Cape Possession to the First Narrow; it curves in to the northward round the cape, fronted by an extensive shoal, stretching off for more than 4 miles from the shore, many parts of which are dry at half-tide; on its south side the depth diminishes gradually, and offers good anchorage for vessels entering the strait to await the tide for passing the First Narrow.

On the western side of the bay are the Direction hills, rendered remarkable by being of a darker green hue than others near them; after passing Cape Possession they afford a good mark for approaching the Narrows, which are not visible until well across the bay; by attention also to their bearings, the shoal that extends off Cape Orange may be avoided. To take up an anchorage on the bank great attention must be paid to the soundings, which at the edge decrease suddenly; it would not be advisable to anchor in less than 10 or 12 fathoms at high water, for the tide falls 6 or 7 fathoms; but as the stream runs much weaker on approaching the edge of the bank, the nearer to it the better. A good berth for anchoring is to get the northern Direction hill (which is dark coloured and very conspicuous) to bear S. W. by W.; Mount Aymond, N. W. ¼ W.; and the highest (easternmost) peaked hillock upon Cape Orange, about S. S. E. When the hill above noticed bears S. W. by W., and Mount Aymond N. W. by W. ¼ W., you are in 19 or 20 fathoms, just off the edge of the bank; about half to one mile more to the northward, or north-westward, good anchorage may be selected out of the strength of the tide.

There is, however, a more advanced situation about half a mile to the eastward of the end of the shoal, that may easily be taken up, namely, that where 14 fathoms is marked on the chart, for which the following are the bearings, the northern Direction hill, S. W. by W.; Mount Aymond, N. W. ¼ N.; Peak of Cape Orange nearly S. S. E. One mile more in advance to the S. W. would still be a better berth, but great care must be taken not to ground on the tail of the shoal; at about half a mile more to the eastward the situation would be secure. Should the distant land behind Cape Gregory be seen, which makes with a long blue level strip of land, terminating at its S. W. end with rather a bluff or precipitous fall, it is a good mark for the above anchorage. There is also a conspicuous lump on the same land, which will be seen to the northward of the northern Direction hill; and the Asse's ears, nearly out of sight, should be seen a little to the eastward of that part of the shore of Possession bay where the cliffy coast commences.

To avoid the north shoals do not get the north Direction hill to bear more southerly than S. W. by W.; and the mark for avoiding the reefs that extend off Cape Orange is not to get the same Direction hill to bear more westerly than W. by S. ¼ S., until Mount Aymond bears nearly N. W. ¼ W. or the peak of Cape Orange S., when the fair-way of the First Narrow will be open, bearing S. W. by S. The N. or N. W. side of the First Narrow is a cliff of moderate height, and makes like a flat table-land. When abreast of Cape Orange a S. S. W. course must be steered. The tide sets right through, so that in drifting, which with the wind against the tide, is the safest and best plan, there is no danger of being thrown upon the shoals.

The *First Narrow*, called Angostura de Nuestra Senora d'Esperanza, is 3 leagues long, and less than half a league wide, with cliffy shores, the tide running strong, and the depth more than 50 fathoms, sand and pebbles;

and on the north shore there is a beach of shingle. In this part, however, as discretion must be the best guide, it will be necessary merely to state the dangers that exist. To the north of *Point Delgada* the shore is fronted by extensive shoals that dry at half tide: these should not be apprached. The south shore, also, for nearly 5 miles to the west of Cape Orange, has a shoal off it, but it does not extend to a great distance from the beach; beyond this it is not safe to approach either shore within half a mile, for each is fronted by a bank that dries at low water. The western end of the narrow on the north shore, Point Barranca (meaning a cliff) has a considerable reef off it, upon which there is a very large quantity of kelp.

After emerging from the narrow, the ship should be allowed to drift with the tide, the course of which is S. S. W. for at least 3 miles, before hauling up for Cape Gregory, in order to avoid the ripplings which rage furiously on each edge of the bank. It is an anchorage that ought not to be taken up without the greatest necessity, for the ripplings break over the deck, and the security of the vessel very doubtful. After reaching thus far steer W. S. W., until abreast of some remarkable peaked hillocks on the north shore, where, if necessary, anchorage may be had, out of the tide, in from 6 to 10 fathoms; at any part of the northern side of the bay the anchorage is good, upon a clay bottom covered with broken shells; the lead brings up nothing but shells, underneath, however, it is of clay, and good holding ground. It is best to anchor near the shore, on account of the tide, which ripples very much all over the centre of the bay.

The peaked hillock, above-mentioned, is certainly Sarmiento's Point Nuestra Senora del Valle, to the eastward of it is St. Iago bay, and to the westward his bay of the Eleven Thousand Virgins. When abreast of the point, the land and bay to the north of Cape Gregory will be easily distinguished, the former will be first seen, and resembles an island, for the land of the bay is flat and low; but a very conspicuous hummock will also be seen half-way between it and the flat table-land, as soon as the land of the cape becomes visible.

The extremity of Cape Gregory bears, from the western end of the First Narrow, S. W. ½ W. (W. S. W. ½ W.) distant 22 miles. The anchorage is from 2 to 2½ miles to the N. N. E. of the cape, abreast of the north end of the sand-hills that form the headland, and at about one mile from the shore, in from 13 to 15 fathoms. The bottom is excellent, a soft but tenacious mud, which, nearer the shore, is of a stiffer quality. At low water a sand-spit extends off for one-third, or nearly half a mile, from the shore, close to which there are 7 fathoms water; care shold be taken not to approach too near. At the anchorage the tide turns to the S. W. towards the cape, for two and a half or three hours before it begins to run to the westward in the Second Narrow, which should be attended to, for a ship will lose much ground by weighing before an hour or more after the tide has turned. Upon the summit of the land of the cape, four-fifths of a mile to the northward of the extreme point, is a remarkable bush, close to which the observations were made. The bush is in latitude 52° 38′ 3″ S. and longitude 70° 9′ 51″ W.; the variation of the compass 23° 34′ E.

The Second Narrow is about 10 miles long, and, with a favourable tide, which runs 5 or 6 knots, is very quickly passed. With an adverse wind a ship will easily reach an anchorage to the north of Elizabeth island. The north side of the Second Narrow is very shoal, and ought not to be approached, for the ground is also very foul. There are two or three very inviting bights for a ship that is caught with the tide, but it is not advisable to anchor in them; it is better to return to the anchorage off Cape Gregory. In *Susannah cove* there is anchorage in 8 fathoms, low water, half a league from the land, good bottom. The south shore of the Second Narrow, called the *Sweepstakes foreland*, is composed of cliffs, and of bold approach. The projecting head, in the centre, is called St. Simon's head, and the western end is named Cape St. Vincent, from its resemblance to that of Spain. To the southward of the eastern point of this head, Point St. Isidro, which is a low sandy point, is Fish cove, in which there is anchorage in 6 fathoms, sandy bottom. Three miles to the westward of Cape Gracia, the western end of the Second Narrow, on the north side, is **OAZY HARBOUR**, a secure place for small vessels; the entrance is nearly two miles long, and too narrow for large ships, unless the weather be moderate, when they might drop in or out with the tide: the depth inside is from 3 to 10 fathoms. There is neither wood nor water to be got, and therefore no inducement to enter it.

PECKETT'S HARBOUR is 8 miles to the west of Cape Gracia, and, although very shoal, offers a good shelter, if required, for small vessels, but the space is very confined; the anchorage without is almost as safe, and much more convenient. The distance between the two points of entrance is nearly two miles, but from the N. E. shore to the small island off the S. W. point the whole space is a shoal, upon the greater part of which the sea breaks in a moderate breeze. The entrance is between the S. W. point and the island, and is rather more than one-fifth of a mile wide. Half a mile outside the anchorage is good, in 7 fathoms; shoal ground extends for a quarter of a mile off the point.

The bay, which is formed by Peckett's harbour and Elizabeth island, is extensive and well sheltered, with an easy depth of water all over, between 5 and 7 fathoms, the nature of the bottom is clay, and offers excellent holding ground. In the centre is a patch of kelp, but it is not known whether the depth is shoaler in that part, or whether it proceeds from the bottom being rocky. The *tide* is not strong to the westward of the north end of Elizabeth island, but runs with considerable velocity in the deep channel between it and the Second Narrow. To the southward of the island the stream divides into two directions, and very soon loses its strength; one sets down the south side of the island, and the other between the islands of Santa Martha and Magdalena; this is the flood, the ebb sets to the northward. The ebb and flow are regular, high water, at the full and change, being at about 12 o'clock.

There is good anchorage, out of the strength of the tide, at a mile to the north of Point San Silvestre; it is convenient for a ship to leave with the intention of passing round Elizabeth island,—this is considered the most difficult part of the entrance of the Strait of Magalhaens, for the tide sets across the passage with some strength.

The passage to the west of the island is clear, and without danger, by keeping in the middle part of the channel; but, in passing down the south side of Elizabeth island, the shore should be kept close-to, to avoid being thrown upon the islands of Santa Martha and Magdalena, although there is plenty of water between them, as well as to clear the shoal that extends off the S. W. end of the latter island, upon which there is not less than 5 fathoms water upon any part; but the ground being irregular, and much kelp strewed about, it is not safe to trust too much to appearances. On all occasions it is advisable to avoid passing through kelp, for, although it frequently shoots up from 10 and even 20 fathoms, yet wherever the bottom is rocky there it is to be found. The presence of this vegetable renders the few dangers that exist in the navigation of the strait of little consequence, for it serves as a buoy to mark the existence of them, and it is only by a careless look-out that a ship can be placed in a dangerous situation. Another advantage in kelp is, that by its drift it shews both the direction and velocity of the tide.

Laredo Bay offers good anchorage in the centre and towards the north side, and particularly in the N. W. corner. Off the south point is a large patch of kelp, among which the ground is shoal and foul. Here wood may be procured, and there is a fresh water lake, of a mile in diameter, at about half a mile behind the beach, much frequented by wild ducks. For the purpose of anchorage only, the bay need not be entered, because a very good and secure berth may be found at from one to two miles off it, in 10 to 13 fathoms, having the S. W. extremity of Elizabeth island on with, or a little open of, the trend of Cape Negro. We know scarcely anything of the south side of St. Phillip's bay, or of the coast between Cape St. Vincent and Cape Monmouth. The latter is a lee shore, and should not be approached when the wind is northerly, for there seems to be no harbour or shelter, and the anchorage must be much exposed. Two deep inlets were seen behind Sweepstakes foreland, from the summit of the table-land near Cape Gregory, one of which may probably insulate it, but this was not ascertained. Between Cape Negro and Sandy point is Catalina bay, here good anchorage may be had, from one to two miles and a half from the shore. Here the country begins to be thickly wooded, and to assume a very picturesque appearance, particularly in the vicinity of Sandy point.

Sandy Point projects for more than a mile from the line of coast, and should not be passed within a mile. A shoal projects off it in an easterly direction, the mark for its south edge is a single tree, on a remarkable clear part of the country (a park like meadow) near the shore, on the south side of the point, in a line with a deep ravine in the mountain behind. One mile and a half from the point we had no bottom with 18 fathoms. To the southward of Sandy point, as far as Point St. Mary, good anchorage may be had at three-quarters of a mile from the shore, in 11 and 12 fathoms, sand and shells over clay. At the edge of the kelp, which fronts the shore, there are 5 and 6 fathoms; so that, with the wind off shore, a ship may anchor or sail along it very close to the coast, by keeping outside the kelp. The squalls off the land are very strong, sometimes so much so as to lay a ship on her broadside. It is not prudent therefore to carry much sail in coasting this part; and it is necessary to have the quarter boats secured with gripes, because the wind, for a moment, blows with the force of a hurricane. These land squalls are denominated by the sealers "williwaws."

Point St. Mary is 12½ miles to the south of Sandy point, and may be known by the land trending in to the southward of it, forming *Freshwater bay*. It has also a high bank close to the beach, with two patches bare of trees, excepting a few dead stumps. All the points to the northward are low, and thickly wooded. As the bay opens the bluff points at its south end become visible. When the wind is from the northward, a swell is thrown into the bay; but no danger need be apprehended from its being open to the eastward, for the wind seldom blows from that quarter, excepting in the winter, and then rarely with great strength. If it does, the holding ground is good, and with good gear there is no danger.

In standing into the bay, from the northward, keep within three-quarters to half a mile from the coast, in 10 or 11 fathoms, and, passing Point St. Mary, steer on towards the bluff points at the south end of the bay, until the south pitch of the centre mount bears W. S. W., when you will be clear of the kelp that extends off the north side of the bay, among which there is a sufficiency of water, but the ground is foul; round its edge there are 6 and 7 fathoms. Having the mount bearing as above steer for it, or a little to the south of it, and anchor in 9 fathoms, sandy mud over clay, which will be with the following bearings:—Point St. Mary, N. by W. ½ W.; Outer Trend, N. ¾ W.; Centre Mount (south pitch) W. by N.; entrance of river, N. W. by N.; and South bluff, nearly S. S. E. A good berth may be had much nearer the shore in 6 fathoms, towards which the depth gradually decreases. If the anchorage is used merely as a stopping place, the first is best, for the wind near the shore is apt to flaw and veer about. Should the day be advanced, it is better to anchor in Freshwater bay, than run the risk of being under-way all night, unless it be in summer, with moonlight, and the weather likely to be fine; in this climate, however, the latter is very doubtful, for the weather changes so suddenly that no dependance can be placed upon appearances.

Between Freshwater bay and Point Santa Anna the coast is very bold, and so steep-to as to offer no anchorage, excepting in the bay that is formed by the reef off Rocky point; but it is small and inconvenient to weigh from, should the wind be southerly. POINT SANTA ANNA will appear, on standing down near the coast, to be the termination of the land; it is a long point extending into the sea, having at the extremity a clump of trees; it bears from Cape Valentyn S. W. ½ W. On approaching it, the distant point of Cape St. Isidro will be seen beyond it, but there can be no mistake in recognising it.

TIDES. Along the whole extent of coast, between Point Santa Anna and Elizabeth island, the flood sets to the southward and the ebb to the northward, and it is high water about 12 o'clock, at full and change. The variation is about 23° W. The strength of the tide is not great, but frequently, after a southerly wind, there is, in the offing, a current to the northward independent of the tide. In winter the tides occasionally rise very high, and, on one occasion, in the month of June, nearly overflowed the whole of the low land on the west side.

PORT FAMINE. In standing into this port pass round Point Santa Anna, if with a leading wind, at one-fifth of a mile, in 17 fathoms; but, if the wind is scanty, do not get too near on account of the eddy tide, which sometimes sets towards the point. Steer in for the bottom of the bay, for the summit of Mount St. Philip, keeping it over the centre of the depth of the bay; that is half-way between the rivulet (which will be easily distinguished by a small break in the trees) and the N. W. end of the clear bank, on the west side of the bay. This bank being clear of trees, and covered with grass, is very conspicuous. Keep on this course until the mouth of Sedger river is open, and, upon shutting in the points of its entrance, shorten sail and anchor in 9, 8, or 7 fathoms, as convenient. The best berth, in summer, is to anchor over towards the west side, in 9 fathoms, with Cape Valentyn in a line with Point Santa Anna; but, in the winter season, with N. E. winds, the best berth is more in the centre of the bay. High water, at full and change, at 12 o'clock, the ebb sets to the northward and the flood to the southward; but the rise and fall is very irregular, depending entirely upon the prevalence of the winds, northerly and easterly winds causing high tides, and westerly and south-westerly low tides. The variation is about 23° 30′.

The strongest winds are from the S. W.; it blows also hard sometimes from South, and, occasionally, a fresh gale out of the valley, to the south of Mount St. Philip. Unless a long stay be meditated, it would be sufficient to moor with a kedge to the N. E.; the ground is excellent all over the port, being a stiff tenacious clay. Landing may be almost always effected, excepting in easterly gales, on one side or the other. There is firewood in abundance on the beaches, and wells, containing excellent fresh water, at the N. W. extremity of the clear part of Point Santa Anna, on the bank above the third, or westernmost, small shingle bay. The water of the river, as well as of the ponds, of which there are many upon the flat shore of the western side of the port, is very good for present use, but will not keep, in consequence of its flowing through an immense mass of decomposed vegetable matter; but the water of the wells drain through the ground, and not only keeps well, but is remarkably clear and well tasted.

USELESS BAY is more than 30 miles deep, and from 12 to 20 wide, entirely exposed to the S. W. The north shore affords no shelter, but on the south there is an indentation of the coast under Nose peak, that may possibly afford a sheltered anchorage.

DAWSON ISLAND, fronting Useless bay, and the deep inlet, called ADMIRALTY SOUND, is 46 miles long and about 20 broad. Cape Valentyn, its northern extremity, is low, but becomes visible, in passing down the opposite shore, between Sandy point and Freshwater bay. Mount Graves, however, is seen from a much greater distance. On the western side of the island there are but two places in which vessels can anchor, viz:—Lomas bay and Port San Antonio, but, both being on a lee shore, they are not to be recommended. Lomas bay is a deep bight, sufficiently sheltered from S. W., but quite exposed to the N. W. and Westerly winds, which, during the winter, are the most prevalent. It has been remarked by Lieutenant Graves, "That Lomas bay, although only tolerably sheltered from the prevailing winds, would, from its extent (six miles deep) and nature of the bottom (a stiff blue clay) afford good shelter for vessels of any draught or burthen." The appearance of the shores also seem to favour such an opinion, for scarcely any drift wood was found thrown up, even in those parts which are most exposed to the surf. Wood is sufficiently plentiful, and water very abundant.

PORT SAN ANTONIO, situated about the centre of the west coast, has the appearance of being well sheltered, but during a fortnight, says Captain King, "That we spent there, we experienced so much inconvenience, and even risk, from the violence of the squalls, that we were obliged to secure the vessel with three anchors. We also found some difficulty in leaving it, on account of the baffling winds, as well as the narrow width of the passage, for we went out by the north entrance. It is a very unfit place for a ship, or, indeed, for any vessel to enter, especially when there are so many much better places on the opposite, or continental shore."

The anchorage is formed by a channel within the islands, North island and San Juan island, in which, particularly at the north end, are several islets. The anchor may be dropped in from 10 to 15 fathoms, off a small beach in Humming-Bird cove, which is situated on the inner side, and about half a mile from the south end of San Juan island. From the west end of North island a reef extends off for a quarter of a mile; and to the southward are two small islets, which may be passed on either side; North island is separated from San Juan island by a narrow and impassable strait. The south entrance is, perhaps, the best, although with a northerly wind the northern should be preferred. There is no danger but what is evident; the ground, however, is not very clean until you reach Humming-Bird cove. PORT VALDEZ is a deep inlet fronting W. N. W.; from the appearance of the hills squalls must be very frequent, and blow with the greatest violence, for trees are seen torn up by the roots, in long lines, evidently caused by the destructive force of the wind. The ebb tide sets to the north through the channel.

THE GABRIEL CHANNEL separates Dawson island from the Tierra del Fuego; it is 25 miles long, and from half a mile to one mile and a half wide, the narrowest part being in the centre. The north shore is a ridge of slate, rising abruptly to a sharp edge, and then as abruptly descending on the opposite side, where it forms a valley. The south side is formed by a high mass of mountains, probably the most elevated land in the Tierra del Fuego, among many of its highest peaks are two more conspicuous than the rest, *Mount Sarmiento*, and *Mount Buckland.* The first is 6,800 feet high, and, rising from a broad base, terminates in two peaked summits, bearing from each other N. E. and S. W., and are about a quarter of a mile asunder. It is the most remarkable mountain in the strait, but, from the state of the climate, and its being clothed with perpetual snows, it is almost always enveloped in condensed vapour. During a low temperature, however, particularly with a N. E. or S. E. wind, when the sky is often cloudless, it is exposed to view, and presents a magnificent appearance. *Mount Buckland* is, by estimation, about 4,000 feet high; it is a pyramidal block of slate, with a sharp pointed apex, and entirely covered with perpetual snow. At the extremity of the channel is Fitton harbour, and on the opposite side of Cape Rowlett are Port Cooke and Brookes harbour.

PORT COOKE is a very convenient and useful port; it is sheltered by a high wooded island. The anchorage is off the rivulet, on the west side, in 9 fathoms. BROOKES HARBOUR is spacious, but not good as a port, for the water is deep, and the anchorages, being in coves, are not easy of access without the labour of towing.

ADMIRALTY SOUND is 7 miles wide at the entrance, and gradually diminishes to three. On its north side the shore is very straight, but the south side has two deep inlets, Ainsworth and Parry harbours. It terminates in a bay, affording anchorage in from 10 to 15 fathoms, but very much exposed to N. W. winds, which, from the funnel shape of the sound, doubtless blow with furious strength. On the north side of the bay is Mount Hope, a lofty insulated mass of rock, but to the south of it lies a considerable track of low land. In AINSWORTH HARBOUR there is anchorage at the bottom, on the west side. The mountains, at the back of the harbour, are capped by an enormous glacier that descends into the sea. PARRY HARBOUR is about 5 miles deep and 3 wide; at the entrance, on the west side, are two coves, either of which offer a convenient stopping place for a small vessel.

The eastern side of DAWSON ISLAND is very much intersected by deep inlets, particularly Brenton sound, and its termination, Port Owen, which very nearly communicates with Lomas bay,—the dividing land being low and marshy. *Wickam island*, the large central island in Brenton sound, is high, and there is a remarkably sharp-peaked hill upon it, which is seen in clear weather from Port Famine. NON-ENTRY BAY was not examined, it appeared to offer snug anchorage; the depth between the points of entrance was from 9 to 19 fathoms. The bottom and south side of FOX BAY are shoal, but the banks are indicated by kelp; a rapid stream of water empties itself into the bay: the anchorage is in from 3 to 5 fathoms. The north head, Steep-Tree bluff, is of bold approach; within 20 yards of the shore the depth is 9 fathoms. HARRIS BAY is an indenture of the coast two miles deep, and WILLES BAY, off which is *Offing island*, by which it may be known, although of small extent, affords excellent anchorage, upon a mud bottom, in 9 or 10 fathoms. The tide rises and falls about 6 feet. It is high water, at full and change, about 12 o'clock. At the bottom of Willes bay is Philip Gidley cove, where a small vessel may lie in perfect security. There are not less than 3 fathoms in the entrance, and inside, in most parts, there is the same depth.

CAPE ST. VALENTYN is the northern extremity of Dawson island; it is low, and has a small hummock near the point. Between the two points which form the cape there is a slight incurvation of the shore, which would afford shelter to small vessels from any wind to the southward of east or west; but the water is shoal, and the beach, below high water mark, is of large stones. The coast to the S. W. is open, and perfectly unsheltered; it is backed by cliffs: the beach is of shingle.

MAGDALEN SOUND. In coming from the northward it appears to be a continuation of the strait, and it is not until after passing Cape San Isidro that the true channel becomes evident. It extends in a southerly direction for 20 miles, and is bounded on either side by high and precipitous hills, particularly on the west shore. The eastern entrance of the sound, Anxious point, is a low narrow tongue of land, with an island off it. Opposite to it is a steep mountain, called the Vernal, or Summer-house, from a remarkable lump of rock on its summit. Under this mountain is HOPE HARBOUR, a convenient stopping place for small vessels bound through the sound. The entrance is narrow, with kelp across it, indicating a rocky bed, on which we had not less than 7 fathoms. Inside it opens into a spacious basin, with good anchorage in 4 fathoms, sheltered from all winds, excepting the squalls off the high land, which must blow with furious violence during a S. W. gale. To the south of Hope harbour, between the Vernal and Mount Boqueron, is STOKES'S INLET; it is 3 miles long, with deep water all over; there is a cove on its north side, but neither so good nor so accessible as Hope harbour. In the entrance of the inlet are Rees islets.

MOUNT BOQUERON, the extremity of which is Squally point, is a very precipitous and lofty mountain, about 3,000 feet high, and having on its summit three small but remarkably conspicuous peaks. It is the eastern head of Stokes's inlet, and forms a part of the western shore of Magdalen sound; the squalls that blow off this during a S. W. gale are most furious and dangerous, unless little sail be carried. The sound here is not more than 2½ miles wide. On the opposite shore, within Anxious point, is an inlet extending to the S. E. for 2 or 3 miles, but it is narrow and unimportant. SHOLL BAY is a small bight, 5 miles to the south of Squally point; there is a reef off it, the position of which is pointed out by kelp. On the opposite shore is KEATS SOUND, extending to the S. E. for 6 or 8 miles, and is between 4 and 5 miles wide. In the centre of Magdalen sound, abreast of the above opening, is a rocky islet; and at a short distance to the southward, on the western coast, is a bay and group, called Labyrinth islands, among which small vessels may find good anchorage. TRANSITION BAY is deep, and of little importance. Four miles farther, at Cape Turn, the shore trends suddenly round. Here Magdalen sound terminates, and COCKBURN CHANNEL commences. The bottom of Magdalen sound is 6 miles wide, but at Cape Turn the channel narrows to 2 miles, and in one part is not more than one mile and two-thirds wide.

WARP BAY, although exposed to southerly winds, is a convenient stopping place, and Stormy bay is a very wild unsheltered place, unfit for any vessel to stop at. At the anchorage the water is deep, 17 to 20 fathoms, and the bottom rocky. The bay is strewed over with shoals, the existence of which is marked by kelp; these narrow the channel so much as to render the entrance and exit both intricate and difficult for any but a small and handy vessel. PACK BAY is both very snug and secure, with good anchorage in 12 fathoms, sand and mud. It has the same disadvantage as Stormy bay, in being on the lee side of the channel, and is, therefore, difficult to leave. There is, however, here more room to beat out, and no dangers to encounter but what are visible. At the N. E. angle of the bay is a narrow isthmus, not more than 500 yards across, separating it from Mercury sound, which was not examined.

In working down the channel, the south side should be preferred, as it is a weather shore, and seems to be better provided with coves and harbours to anchor in. KING AND FITZROY ISLANDS, in mid-channel, are of bold approach, as are also KIRKES ROCKS, more to the westward. The flood tide sets to the southward, or to seaward, but was not found to run with sufficient strength to benefit or impede a vessel beating through. The rise and fall is also inconsiderable, not being more than 6 or, at most 8 feet at spring tides.

PROWSE ISLANDS. There are several anchorages among these islands, which are very numerous, and skirt the coast for several miles. Behind them the land trends in, and forms a deep sound. The Adelaide schooner anchored in a bay, on the north side of one of the islands, opposite to Barrow head, in 6 fathoms; but there are many places of a similar nature, equally convenient and secure. The distance across the channel, between Prowse island and Barrow head, is scarcely one mile and a half.

DYNELY SOUND extends for more than 9 miles, in a N. W. direction, into the interior of Clarence island. On the west side of its entrance is a group of islands, affording several anchorages, one of them, Eliza bay, affords shelter and security from all winds.

MELVILLE SOUND forms the embouchure of the Barbara and Cockburn channels; it is very extensive, and completely filled with islands. Some of them are of large size, and all are of the most rugged and desolate character. The offing is strewed with clusters of rocks; of these the East and West Furies are the most remarkable, as well as the most important, for the passage into the Cockburn channel lies between them. The former are very near the land of Cape Schomberg. The West Furies bear from the Tower rock, off Cape Noir, E. ½ N., distant 25 miles; and S. S. W. ¾ W. 11 miles from Mount Skyring. The Tussac rocks, which are two in number, bear from the West Furies E. N. E. ½ E., 4½ miles; and in a line between the East and West Furies, 3 miles from the latter, and 2 from the former, is a rock standing alone, it bears from Mount Skyring S. by W., 12½ miles. To avoid it, in entering, with a westerly wind, pass near the West Furies, and steer for the Tussac rocks; after passing these, there are no known dangers in the entrance of the Cockburn channel. Mount Skyring is a very prominent object, it rises to a peak to the height of 3,000 feet, and is in latitude 54° 24′ 44″ S., and longitude 72° 7′ 40″ W. The variation is 25°.

BARBARA CHANNEL. Four remarkable mountains point out the southern entrance to this channel very distinctly. The *Kempe peaks* are high, and shew three points. The *Fury peaks* are high and divided; *Mount Skyring* is high, and has a single peak; *St. Paul's* is similar to, and in one view, from near Fury island, appears very like the dome of the cathedral whose name it bears. This entrance is so very much occupied by islands and rocks, that no direct channel can be perceived. For small vessels there is neither danger nor difficulty; there are numerous anchorages that they might reach without trouble, which would afford perfect security. Among MAGILL'S ISLANDS there are several coves and anchorages. TOM'S HARBOUR is good and well sheltered, excepting from the violent squalls off the high land, which are so frequent everywhere among the coves of Tierra del Fuego. For sealing vessels, however, it is more safe and secure than Fury harbour, the place they usually frequent. Every thing that Fuegian harbours afford is to be obtained in it. NORTH COVE, at the north side of Fury island, is a snug and perfectly safe anchorage; it is, however, only fit for small vessels.

When there they are in security, but it must be remembered that there is no anchorage in the channel, nor until you get into the cove, unless you close the weather shore, and find a creek, in which the anchor will hold you temporarily. At the south-east side of Fury island is FURY HARBOUR, a very wild anchorage. From its contiguity to the East and West Furies, and the Tussac rocks, on which seals are found, it is much frequented by sealing vessels.*

BYNOE ISLAND affords an anchorage on its N. E. side; and HEWETT BAY is a good stopping place, either for entering or quitting the channel. BROWN'S BAY is more extensive, but also affords good shelter in a small cove at the north entrance, in 8 fathoms, sand, among some kelp. NORTH ANCHORAGE, for a small vessel, is tolerably secure, but not to be recommended. Between Hewett bay and North anchorage the channel is strewed with many rocks and shoals, some of which, although covered with kelp, only shew at half-tide. Much caution is therefore necessary, and all patches of kelp should be carefully avoided. The tide, to the northward of North anchorage, which, to the southward, was not of sufficient consequence to interfere with the navigation of the channels, is so much felt as to impede vessels turning to windward against it.

BEDFORD BAY is a good anchorage; it is situated on the N. W. side of the narrow part of the channel. Its depth is from 20 to 8 fathoms, good holding ground, and perfectly sheltered from the prevailing winds. At its entrance are several patches of kelp, the easternmost of which has 4 fathoms on it. Here, as well as throughout the Barbara channel, the flood tide sets to the southward. NUTLAND BAY, having 8 and 15 fathoms over a sand and mud bottom, may be known by two small islands, Hill's islands, which lie one mile N. N. E. from the anchorage. Between Bedford and Nutland bays, and, indeed, as far as the Shag narrows, the channel is open, and may be navigated without impediment. There are many bays and inlets not here described or noticed, that may be occupied, but almost all require to be examined. They all trend far enough into the land to afford good shelter, but in many the bottom is foul and rocky, and the water too deep for anchorage. The western coast, being the windward shore, should, of course, be preferred. FIELD'S BAY is too exposed to southerly winds to be recommended as a stopping place, unless the wind be northerly; Nutland bay is a more convenient place to start from with a view of passing the Narrows.

BRODERIP BAY lies to the northward of Nutland bay; at the bottom or northern part of it, are some good coves; but the most convenient of them is at the eastern extreme, called Dinner cove. It extends to the north for about a furlong, and affords good anchorage in 10 fathoms, sufficiently well sheltered and distant from the high land to be free from the mountain squalls, or willi-waws. Round Dinner cove is ICY SOUND, a deep inlet, with a glacier, of considerable extent, at the bottom, from which large masses of ice are constantly falling, and drifting out, occupy the waters of the inlet. The water is deep, and the anchorage not good, when there are so many better places. DEAN HARBOUR is a considerable inlet, trending in under the same glacier, which extends from the head of Smyth harbour, to a considerable distance in the S. W.

SHAG NARROWS is the only navigable communication that exists between the Barbara channel and strait; it is on the western side of Cayetano island.

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* In the winter of 1826-27, the Prince of Saxe Coburg, sealer, was wrecked in Fury harbour, and the crew saved by the Beagle's boats. *Captain King.*

The width of the opening is at least one mile and three-quarters, but the eastern portion is so filled with rocky islets and shoals, that the actual breadth of the only navigable part, at the northern end, is about 100 yards, and the widest part, at the south end, scarcely half a mile. It is formed, on the west side, by a projecting point of high land, that gradually trends round to the westward; and, on the opposite side, by three islands, the northernmost of which is Wet island, on the southernmost is *Mount Woodcock*. Between Wet island, where the narrows on the north side commence, and the western shore, the width is not more than 100 to 150 yards, and perhaps 300 yards long. Through this the tide sets as much as 7 miles an hour; the sides of the rocks are steep-to, so that no accident can happen to a ship in passing them, notwithstanding the want of room for manœuvring. At the south end of Wet island the stream of tide divides—one sets to the eastward, round Wet island, whilst the principal runs through the Shag narrows. And in the same manner, a part of the southern tide, which is the flood, after passing Wet island, rounds to the S. E., round the eastern side of Mount Woodcock. All the space to the eastward of Mount Woodcock is so strewed with islands and rocks, that the passage must be difficult, if not dangerous.

To avoid the danger of being thrown out of the narrows, it is only necessary to keep the western shore on board; where there are no indentations, the tide will carry a vessel along with safety. At the north end of the narrows, on the west side, is a shelving point, on which there are 5 fathoms,—here there is an eddy, but as soon as the vessel is once within the narrows (within Wet island) the mid-channel may be kept. In shooting this passage, it would be better to furl the sails and tow through, for, if the wind be strong, the eddies and violent squalls would be very inconvenient, from their baffling and laying the vessel upon her beam ends, which frequntly happens, even though every sail be furled. It will be necessary to have a couple of boats out, ready, either to tow the ship's head round, or to prevent her being thrown, by the tide, into the channel to the south of Wet island.

If anchorage be desirable after passing the narrows, there is none to be recommended, until the coves between Smyth harbour and Cape Edgeworth be reached,—of these Dighton cove is preferable. The anchorage is off the sandy beach, in 20 fathoms. Warrington cove also offers good shelter and anchorage, but both are exposed to easterly winds. The tide in the Shag narrows, at full and change, commences to set to the southward at 12 o'clock. In the Barbara channel the flood tide was found to set to seaward, or to the southward, as was also the case in Cockburn channel.

Smyth Harbour is about 4 miles deep, and from half to one mile wide, surrounded by high land, and trending in a westerly direction. The water is deep, excepting in Earle cove, on the north side, where vessels might lie, if necessary, but it is a very wild place in bad weather. The hills at the head are capped by glaciers, that communicate with those at the head of Icy sound. It seems possible that all the mountains between this and Whale sound are entirely covered with a coating of ice.

Half a mile S. E. from Cape Edgeworth is a *shoal*, so thickly covered with kelp as to be easily seen in passing or approaching it; there are not more than two feet of water over its shoalest part.

To pass through the Barbara channel, from the north, it would be advisable to stay at Port Gallant until a favourable opportunity offers; for, with a S. W. wind, it would neither be safe nor practicable to pass the Shag narrows.

Winds. The N. W. wind prevails more than any other in the western portion of the strait, in consequence of the reaches trending in that bearing. It seems to be a general rule, hereabouts, that the wind either blows up or down them. Between Cape Froward and the western entrance of the strait, the wind is generally from N. W., although at sea, or in the Cockburn or Barbara channels, it may be in the south or south-western boards.

Port Famine to Cape Froward. The river Sedger, which is fronted by a bar that dries at low water, can be entered by boats at half-tide, and is navigable for 3 or 4 miles. The water is fresh at half a mile from the entrance, but, to ensure its being perfectly good, it would be better to fill the casks at low tide. The low land near the mouth, as well as the beach of Port Famine, is covered with drift timber, of large size, which will be found useful, and serviceable for repairing boats. Voces bay is to the southward of the south point of Port Famine, where the river Sedger falls into the sea. A ship may anchor in from 7 to 10 fathoms off the Second river, but the shelter is not so good as in Port Famine. The Second river has a shoal entrance, but extends for some distance up the valley.

Between this bay and Cape San Isidro the water is too deep for anchorage, even close to the beach. The cape is the termination of the ridge, whose summit is Mount Tarn, the most conspicuous mountain of this part of the strait. It is 2,600 feet high, and is readily distinguished from abreast of Elizabeth island, whence it appears to be the most projecting part of the continental shore. When viewed from the northward its shape is peaked, and during the summer it has generally some patches of snow a little below its summit; but, in the winter months, its sides are covered with snow for two-thirds down. From abreast, and to the southward, of Port Famine, it has rather a saddle-shaped appearance, its summit being a sharp ridge, extending very nearly for one mile N. W. and S. E., with a precipitous descent on the N. E., and a steep slope on the S. W. sides. There is a low but conspicuous rounded hillock, covered with trees, at the extremity of Cape San Isidro; and a rocky patch extends off it for two cable's length, with a rock at its extremity that is awash at high water: it is covered with kelp.

Eagle Bay is about three-quarters of a mile deep, and its points one mile apart, bearing N. E. and S. W. The anchorage is at the head, in from 20 to 12 fathoms; a small reef extends for about a cable's length off the S. W. point of the bay, on which is an islet. Eagle bay is not useful for any but a small vessel that can be towed in, and then it will be necessary to steady her by warps to the shore. The squalls, or willi-waws, at times, are very violent. Gun Bay, the next to the westward, although small, affords anchorage for a single vessel near the shore, at its S. W. part, in from 8 to 9 fathoms. Two rivulets discharge themselves into it, from which water is easily procured; the bottom is a stiff clay, and good holding ground. A round hill, of moderate elevation, and thickly wooded, separates it from Indian Bay, the points of which are distant more than one mile and a quarter. From the east point the shore runs due west, curving round at the bottom towards an islet covered with trees, between which and the shore there is only sufficient depth for a boat to pass. A rock about 12 feet high lies to the S. E., on either side of which is an anchorage, sufficiently sheltered from the prevailing winds, over a good bottom, in from 7 to 9 fathoms; the north side of the bay is shoal. A patch of kelp extends off the S. E. point for two cable's length, but has 9 fathoms over it at the centre.

Bouchage Bay is small and the water very deep, except near the bottom, where an anchorage may be obtained in 8 fathoms, clay. It is separated from BOURNAND BAY by Cape Remarquable, which is a precipitous, round-topped, bluff projection, wooded to the summit. At two cable's length from the base no bottom was found with 20 fathoms of line; but, at the distance of 50 yards, the depth was 20 fathoms. Bournand bay is more snug and convenient than Bouchage bay, it being sheltered from the southerly winds by Nassau island. At the S. W. end of a stony beach, at the bottom, is a rivulet of good water, off which there is good anchorage in 8 fathoms, stiff mud.

BOUGAINVILLE BAY forms a basin, or wet dock, in which a vessel might careen with perfect security. It is, from its small size, great depth of water, and the height of the land, rather difficult of access, which renders it almost always necessary to tow in. On entering the anchor should be dropped in 12 fathoms, and the vessel steadied by warps to the trees, at the sides and bottom of the cove. It is completely sheltered from all winds, and an excellent place for a vessel to remain at, particularly if the object be to procure wood, which grows here to a great size, and is both readily cut down and easily embarked. A rivulet at the bottom affords a moderate supply of water; but, if more be required, the neighbouring bays will afford an abundance.

In the passage between Nassau island and the main the least water is 7 fathoms, over a stiff clay bottom, gradually deepening on each side. But the winds being baffling and the tides irregular, and rippling in many parts, a vessel should not attempt it but from necessity.

ST. NICHOLAS BAY is not only of larger size than any of the bays to the south of Cape San Isidro, but is the best anchorage that exists between that cape and Cape Froward, as well from its being more easily entered and left, as from the moderate depth of water, and extent of the anchoring ground. Nearly in the centre is a small islet covered with trees, between which and the shore is a passage with 9 fathoms water, stiff clay. The shore is, however, fronted for its whole length, by a shoal bank, which stretches off to the distance of a quarter of a mile from the shore; the edge is steep-to, and generally distinguished by the ripple, which, with a moderate breeze, breaks at half-tide. In coming in, keep sail upon the ship, in order to shoot into a good berth, on account of the high land of *Nodales peak* becalming the sails, and to avoid the drift of the stream of the river setting the ship over to the eastern side of the bay. In taking up an anchorage much care is necessary to avoid touching the bank. Less than 10 fathoms is not safe, but in that depth the security is perfect, and the berth very easy to leave. In passing through the strait, this bay is very useful to stop at, as well from the facility of entering and leaving it, as for its proximity to Cape Froward. In the middle of the bay is De Gennes river, which from its entrance being fronted by a shoal or bank, and its being strewed with trees that drift out of the river during the winter freshes, it is far from being an eligible place for procuring water.

From Glasscot point, the southern head of the bay, the coast extends in nearly a straight line to Cape Froward, a distance of 7 miles, the land at the back continuing mountainous and woody. A point, formed by a beach of shingle, covered with trees to within 20 yards of the water's edge, and distant nearly 3 miles from Cape Froward, is the only projection. Between this and the entrance of a rivulet, which waters the only valley that exists in this space, an anchorage at a quarter of a mile from the shore, in 11 fathoms, might be occupied during a westerly wind; but with the winds more southerly it would be too much exposed to be safe.

CAPE FROWARD rises abruptly from the sea, at its base is a small rock. The hill that rises immediately above the cape is called the Morro of Santa

Agueda. Cape Froward is in latitude 53° 53′ 43″ S., longitude 71° 14′ 31″ W. The ebb tide sets to the northward, and the flood to the southward, but with very little strength. It is high water at full and change at one p. m.

The north coast off CLARENCE ISLAND is indented by sounds stretching deeply into the island, and extending from the entrance of Magdalen sound to that of Barbara channel. The port of Beaubasin is sufficiently pointed out by the small rocky islet called *Periagua* and *Mt. Vernal;* the outer part of the port decreases in width gradually to the entrance of the harbour, which is formed by two projecting points, a very short distance apart, and is very shoal, the deepest water being only 2¾ fathoms. Inside, in the basin, there are 5 fathoms. INMAN BAY, HAWKINS BAY, STAPLES INLET, and SHOLL HARBOUR, are all deep inlets, surrounded by high precipitous land.

LYELL SOUND lies to the westward of Greenough peninsula; it is 9 miles deep, and is separated at the bottom from Sholl harbour by a ridge of hills, about one mile and a half wide. In the entrance are two conspicuous islands one of which is very small. They are called DOS HENNANOS, and bear from Cape Froward S. W. ¼ W., 5½ miles. KEMPE HARBOUR lies 1½ mile within the entrance, on the west side: it is rather difficult of access, but perfectly secure, and would hold six ships. Stokes Creek, on the same side, more to the southward, also offers good anchorage; but from its being out of the way can be of no utility.

CASCADE HARBOUR and MAZZAREDO BAY are of less size, and therefore more attainable, but of the same character with Lyell Sound; viz, deep water, surrounded by high land. On the head land that separates these harbours from Lyell Sound, is a sugar-loaf hill, in latitude 53° 57′ 32″ S., longitude 71° 24′ 13″ W. HIDDEN HARBOUR has a narrow entrance, but offers good shelter.

SAN PEDRO SOUND is the most extensive inlet in Clarence island. It extends, in a southerly direction, for nearly 13 miles, and has three other inlets branching off into the land, two to the westward, and one to the eastward. There is a good, although a small, anchorage on its west side, one mile and a half within the entrance, called MURRAY COVE; and another close to it, which is even more sheltered. FRESHWATER COVE is a confined and indifferent place for a ship.

BELL BAY has a very convenient anchorage, BRADLEY COVE, on its west side; it will readily be distinguished by a small green round hillock that forms its north head. The anchorage is in 17 fathoms, and the vessel hauls in, by stern-fasts, or a kedge, into 9 fathoms, in perfect security. POND BAY, to the northward, has good shelter; but it is not of such easy access, for it would be necessary to tow both into and out of it. MOUNT POND, a peaked hill over the harbour, is a conspicuous mountain, and is visible from the eastward as soon as it opens round Cape Froward. It has two summits, one of which only is visible from the eastward.

ST. SIMON'S BAY lies between Cape Inglefield and Point Elvira, it is studded with islands and rocks, and, at the bottom, has two communications with the Barbara channel, separated from each other by Burgess island, the easternmost of which, called Tom's narrows, is the most extensive; but this, from the irregularity and force of the tides, is not to be preferred to the more direct one of the Shag narrows, on the western side of Cayetano island, for there is no good anchorage in St. Michael's channel which leads to it, and it is bounded by a steep and precipitous coast. The Gonsalez narrows, on the west side of Burgess island, is not more than 30 yards across; and, from the force of the tide, and the fall of the rapid, would be dangerous even for a boat to pass. The only good anchorage in St. Simon's bay is Millar's cove; it is about 3 miles within Point Elvira, and has three rocky islets off its entrance. A conspicuous mount forms the summit of the eastern head. The anchorage is in 5 fathoms, a good bottom, and entirely sheltered. Wood and water are plentiful.

Port Langara lies immediately round the east head of Millar's cove; it is rather more than a mile long, and two-thirds of a mile wide, and trends in a W. N. W. direction. The water is deep, excepting at the head, and in a cove on the north shore, in either of which there is good anchorage. At the former the depth is 8 fathoms, and in the cove 5 fathoms. On the eastern side of the bay are Shipton and Mellersh Coves. Both are surrounded by high land; and the water being very deep, neither of them afford anchorage. Off the head that divides them, are the Castro Islands; on the north side of the largest is a very convenient cove, with a moderate depth of water. The Catellano Islands consist of five principal ones, they are situated in the centre of the bay, and have no anchorage among them.

CAPE FROWARD TO JEROME CHANNEL. This coast, a distance of 40 miles, is very slightly indented. The anchorages are of easier access, and altogether more convenient than those of the southern shore. Snug Bay, situated 5 miles N. W. of Cape Froward, is a slight indentation of the coast, at the embouchure of a small rivulet, the deposits from which have thrown up a bank near the shore, on which anchorage may be had in 8 and 9 fathoms. The best anchorage is half a mile to the E. S. E. of the island, in 9 fathoms, black sand, the rivulet mouth bearing N. N. W. three-quarters of a mile; it is much exposed, being open from W. S. W. by South to S. E. It is a convenient stopping place in fine weather.

Woods Bay, situated under the lee of Cape Holland, is a convenient stopping place for ships, but only small vessels should anchor inside the cove. The anchorage is very good to the eastward of the river's mouth, at half a mile from the shore, in 17 and 13 fathoms water. Small vessels may enter the cove by luffing round the kelp patches, that extend off the south point of the bay, on which there are 2½ fathoms. Entering Woods bay steer for the gap, or low land behind the cape, and, as you near the south point, keep midway between it and the river's mouth; or, for a leading mark, keep a hillock, or conspicuous clump of trees at the bottom of the bay, in a line with a remarkable peak, one or two miles behind, bearing N. W. ½ W. Anchor in 17 fathoms, immediately that you are in a line between the two points; small vessels may go further, into 12 fathoms. The west side of the cove may be approached pretty near, and the depth will not be less than 5 fathoms, excepting upon the two fathoms patch that stretches off the east point, the extent of which is sufficiently shewn by the kelp; but, on the eastern side, the bank shoals suddenly, and must be avoided, for there are 13 fathoms close to its edge, upon which there is not more than two feet water.

Cape Holland is a bold, high, and, although slightly projecting, yet a very conspicuous headland; it is precipitous, and descends to the sea in steps, plentifully covered with shrubs. It is 14 miles to the westward of Cape Froward. Near Cape Coventry, and in Andrews bay, anchorage may be had near the shore, if the weather be fine. To the westward of the former, at half a mile from the shore, there are 13 fathoms,

Cordes Bay lies four miles to the eastward of Cape Gallant, and may be known by the small bright green islet, called Muscle island, that lies in the entrance; also by a three peaked mountain, about 2,000 feet high, standing detached from the surrounding hills, at the bottom of the bay. The western entrance, which lies between the west point and the reef of Muscle island, two-thirds of a mile wide; within it is a bay, one mile deep, but much contracted by shoals covered with kelp, between them, however, the anchorage is very good and well sheltered; the bottom is of sand, and the depth 5 and 7 fathoms. At the extremity of the bay is a large lagoon, PORT SAN MIGUEL, trending in a N. E. direction for two miles, and two-thirds of a mile across; the entrance is both narrow and shoal, and not safe for a vessel drawing more than 6 feet. Inside the lagoon the depth is from 3 to 13 fathoms.

FORTESCUE BAY is spacious, well sheltered, easy of access, and of moderate depth. The best berth is to the S. E. of the small islet, outside of Wigwam point, in 7 or 8 fathoms. Having the entrance of Port Gallant open, small vessels may sail into the port, but the channel is rather narrow. The banks on the western side, off Wigwam point, are distinguished by the kelp. When within the shelter is perfect; but Fortescue bay is quite sufficiently sheltered, and much more convenient to leave. In this part of the strait, as the channel becomes narrowed by the islands, the tides are much felt. There are two good anchorages before reaching the entrance of the Jerome channel, namely, ELIZABETH BAY and YORK ROADS, off Batchelors river, the former has a sandy beach, and a rivulet emptying itself into it; the best anchorage is said to be in 15 fathoms, Passage point bearing E. S. E., distant half a mile, about three cables' length from the river; and to the N. W. of a bank on which there is much kelp. The anchorage of York roads is said to be good and convenient, half a mile off a woody point (just to the westward of the river) bearing N. 6° E., and the mouth of the river N. E., three-quarters of a mile, is a good berth; because there is plenty of room to weigh from, and space to drive, should the anchor drag; the bottom is good, in 10 or 12 fathoms, but not in a less depth.

The set and change of the tide here are very uncertain, on account of the meeting of the Jerome channel tides with those of the strait, which occasions many ripplings. Captain Fitzroy says, "That the tide along shore, near Batchelor river, changed an hour later than in the offing. At Batchelor bay, by the beach, during the first half or one-third of the tide that ran to the S. E. the water fell; and during the latter half or two-thirds it rose. In the offing it ran very strong."

SECRETARY WREN'S ISLAND is a small rocky islet, rising abruptly on all sides, and forming two summits. Near it are some rocks, and to the S. E. is a group of small rocks; and at a mile to the E. S. E. are two rocks above water, called Canoas. CHARLES ISLANDS, besides of some smaller islets, consists of three principal islands; and, in the centre, there is a very good port, having good anchorage within the islets, in 13 fathoms. It has an outlet to the N. W. and one to the S. W., also a narrow point communicates with the strait to the S. E. Opposite to Cape Gallant, on the eastern island, near its N. W. end, is a conspicuous white rock, called *Wallis's mark*. Next to the westward, in succession, are MONMOUTH and JAMES ISLANDS; then CORDOVA ISLET and RUPERT ISLAND; and to the westward of these the island of CARLOS III; the last is separated from Ulloa peninsula by St. David's sound, which is navigable throughout.

To the northward of Whale point, the eastern extremity of Carlos III. island, is a cove, with an anchorage in 15 fathoms, close to the shore, on a steep bank, but bad ground. From the north point of the cove to Rupert's island is a rocky ledge, over which the tide sets with considerable strength. To the westward of Cape Middleton is Muscle bay, about a mile wide, with unequal soundings, from 12 to 40 fathoms, stones. There is an anchorage in from 15 to 30 fathoms, in Bonet bay, close to Carlos III. island; it lies under the S. E. side of some islands opposite to Batchelor river. At a short mile to the eastward of Cape Crosstide, the N. W. end of Carlos III. island, is Tilly Bay, but it has nothing to recommend it, particularly when the much better anchorage off Batchelor river is so close at hand.

Choiseul Bay and Nash Harbour, on the Fuegian coast, are not in the least inviting; the former is a large deceiving harbour-like bay, full of islets and patches of kelp, under which, of course, there are rocks. Between the islets the water is deep and unfit for anchorage. Nash harbour is equally unserviceable. Whale Sound is a large inlet, trending 8 miles into the land, and terminating in a valley, bounded on each side by high mountains. There is anchorage only in one place, the west side of Lart harbour, and, although this harbour appears large, the anchorage is small and close to the shore. St. David's Sound separates Carlos III. island from Ulloa peninsula. At its north end the water is deep, but where it begins to narrow there are soundings in it, on which anchorage might be found, if there was a necessity.

JEROME CHANNEL is narrow, but throughout, free from danger; the western shore is high and steep, and covered with trees; the eastern shore is lower and less wooded. In mid-channel, near its western end, are two islets, not placed in the Spanish chart. On the west side of the Jerome Channel are Wood and Seal Coves, that may be used with advantage by small vessels. On the eastern shore the bights, Three Island bay and Coronilla cove, appeared to be commodious. Arauz bay is open and exposed to the N. W., where the Lago de la Botella joins the Jerome, the latter winds round to the N. E. On its eastern side, behind the False Corona isles, is Cutter cove, affording anchorage for a small vessel. Opposite is Nunez creek with deep water. Abreast of the Corona isles, one of which, the Sugar-loaf, is about 200 feet high, is Sulivan cove, penetrating for 5 miles into the land on the western side of the channel; and, at a league to the northward of the Sugar-loaf, is another opening to the westward, on the north shore of which is Bending cove, which, with Cutter cove, are the only stopping places between Cape Forty-Five and Child's bluff.

Otway Water. Between Child's bluff and Point Stokes the Otway water commences; on the west shore it affords several commodious anchorages. Off Point Villiers, at a quarter of a mile from the shore, there are from 10 to 30 fathoms; and this depth decreases in advancing more northerly. There is anchorage all across the N. E. part of the water, in from 5 to 20 fathoms, the bottom of sandy mud. Inglefield and Vivian Islands, at the west end of the water, are low but thickly wooded. An isthmus, 6 to 10 miles across, separates the Otway water from the strait near Elizabeth island. From an elevated station, on the north side of Fitzroy channel, this narrow neck appeared to be low, and much occupied by lagoons. The south shore of Otway water is formed by high land, with three deep openings. Brunswick Peninsula, a mass of high mountainous land, is the most southern extremity of the continent.

In latitude 52° 40′ S., and longitude $71\frac{1}{2}$° W., is the east entrance of Fitzroy Channel; it forms a communication between the Otway and the Skyring waters, and takes a winding course to the N. W. for 11 miles, which is easily navigated. A strong tide running during the neaps, at the rate of 5 or 6 miles an hour, in the entrance, and of 2 or 3 in other parts, sets through it 6 hours each way. The rise and fall, however, were scarcely distinguishable.

SKYRING WATER is 10 leagues long from east to west; its shores are low. At the western extremity are two openings, which were supposed to communicate with some of the sounds of the western coast, but on a subsequent examination of the termination of the Ancon sin Salida of Sarmiento, by Captain Skyring, no communication was detected.

TIDES. The tide was found to set through the Jerome channel with great regularity, six hours each way. The Spanish account however says, "The current is always in the direction of the channel, but rarely sets to the N. W., particularly in mid-channel and the western shore; on the opposite side, however, the tide sets six hours each way to the N. W. and S. E."

The following observations were made by Captain Fitzroy for the time of high water at full and change, at various parts of the Jerome and its interior waters, viz:—In the entrance of the Jerome, near Arauz bay, at 1 o'clock; near Bending cove, at 3 o'clock; Cutter cove, at 4 o'clock; on the south shore of Fanny bay, at Giddy island, as also at Martin point, at 5 o'clock; at Inglefield island, at 4 o'clock, and at the same hour at the eastern entrance of Fitzroy Channel; but at the western end of it, at 1 h. 15 m. The variation of the compass was found to be at the point of islets, 23° 58′; Donkin cove, 23° 40′; Wigwam cove, 23° 34′; Inglefield island, 23° 56′; Point Marten, 23° 58′, the *Mean* of which will be 23° 49′.

CROOKED REACH is that portion of the strait comprised between the western extremity of Ulloa peninsula and the entrance of the Jerome Channel. In the navigation of this part no one should willingly run the risk of anchoring in any port or bay on its southern shore. Although there are several deep inlets, enough to induce any navigator to trust to them, and, probably, for small vessels, many sheltered nooks might be found, but they have all very deep water, and when the wind blows strong down to Long Reach, they are exposed to a heavy sea, and a furious wind. The anchorage of Borja bay, within the Ortiz islands, is so much preferable that it alone is to be recommended.

BORJA BAY is situated on the northern shore of Crooked Reach, two miles to the eastward of Cape Quod; its position is pointed out as well by the islet off it west point, as by its situation with respect to El Morrion, the helmet-shaped point previously called by the English ST. DAVID'S HEAD. The entrance to the bay is to the eastward of the largest islet, and presents no dangers; all the islets and shores of the bay may be approached to half a cable's length, even to the edge of the kelp. The only difficulty that impedes getting into the bay arises from the baffling winds and violent gusts that occasionally come off the mountains, and down the deep ravines which form the surrounding coast; and the utmost vigilance must be exercised in beating in, under sail, to guard against their effects. The anchorage is perfectly sheltered from the prevailing winds, the westerly and south-westerly gales, and is open only to south-easterly winds, which very rarely blow here, and still more rarely with violence; and as the holding ground is good (small stones and sand) and the depth of water moderate, (14 to 16 fathoms) and any fetch of sea prevented by the narrowness of the strait in this part, the greatest breadth being only 3 miles, it may be pronounced a very good and secure harbour. The best plan is to anchor with the bower, and steadied to the shore by a hawser or a kedge. No surf or swell obstructs landing anywhere; good water and plenty of wood are easy to be embarked; the trees, a species of beech, are of a considerable size. The shores are rocky, and the beach plentifully stocked, as indeed are all parts of the strait to the eastward, with barberries and wild celery.

El Morrion or St. David's Head is a lofty granitic rock, of which the outer face is perpendicular and bare, and of a light grey colour, distinguishable from a considerable distance both from the east and the N. W., and forming an excellent leading mark to assure the navigator of his position.

Cape Quod is a steep up cape, of a rocky greyish face, and shews like a great building of a castle; it points off with a race from the other mountains, so much into the channel of the strait that it makes shutting in against the south land, and makes like an elbow in the strait. Abreast of Cape Quod the current sets to the eastward at one knot and a half an hour.

Barcelo Bay lies to the west of Cape Quod, seems to be large and incommodious, and strewed with small islets. Osomo Bay has very deep water all over, there being 40 fathoms within a cable's length of the beach, excepting on the west side, where there is a rocky ledge, with from 10 to 20 fathoms. Next to the westward is Langara bay. It trends in for about a mile to the N. E., and has 10 to 12 fathoms, stony bottom. It is more sheltered than the two former bays. Posadas Bay is most probably Wallis's Lion cove. Its western point is formed by a high, rounded, and precipitous headland, resembling, in Captain Wallis's idea, a lion's head; and, although Cordova could not discover the likeness, yet it is sufficiently descriptive to point out the bay, were the anchorage worth occupying, which it is not. Wallis describes it to have deep water close to the shore; his ship was anchored in 40 fathoms.

Arce Bay has anchorage in from 6 to 17 fathoms, stones. It divides at the bottom into two arms, each being half a mile deep. The outer points bear from each other W. N. W. and E. S. E., half a mile across. Flores Bay is very small and exposed, with from 6 to 20 fathoms, stones and gravel; at the bottom is a rivulet of very good water. Villena Cove has from 15 to 20 fathoms, and is very open and exposed. Then follows Guirior Bay, extending for more than a league to the north, the mouth being two miles wide. Its west point is Cape Notch, which will serve to recognise it. Near the entrance is an island and several rocks, and within them, on the west side, are two coves, with from 15 to 30 fathoms, stones; beyond them is the port, which has a narrow entrance. A river falls from a considerable height into it, and, by the rapidity of the current, has formed a channel of ooze, in the direction of the entrance, in which there is good anchorage in from 20 to 26 fathoms; on either side of the channel the bottom is stony. The port is too difficult to reach to make it an object of any value. Should, however, a strong gale from South or S. W. oblige a ship to run in, she should avoid passing too near the west side of the narrow, for a reef extends off it for nearly a cable's length. There is also a bank outside the narrow, but it is pointed out by kelp.

LONG REACH. Snowy Sound, a deep inlet, not worth any person's while to enter, excepting for anchorage in a cove at about a mile, and in another at two miles, within its western head. It extends in for 10 miles, and terminates in two inlets, surrounded by high perpendicular black rocks.

Swallow Harbour is one mile and a quarter to the westward of Snowy sound; its anchorage is under the east side of the island, which separates the harbour from Condesa bay, which forms its west side. This harbour has at its mouth three islands and a rock, besides being strewed with kelp which serves to point out the dangers in entering. Within it is very well sheltered from all winds; the depth is from 40 to 16 fathoms, stones, and in some parts ooze. This bay is to the south of Cape Notch; and, to recognize it, there is a cascade falling down the centre of a mountain at the bottom of the port, to the westward of which are two higher mountains, the summit of the eastern being peaked, and the western one rounded.

The bay to the westward of the island is CONDESA BAY; it is full of islets and rocks, and the channel behind the island, communicating with Swallow bay, is very narrow.

At about a cable's length off the west point of the entrance of Swallow harbour Captain Fitzroy saw a rock just awash. This danger should be carefully avoided.

STEWART'S BAY is less than a league from Swallow bay; it is by no means to be recommended as an anchorage, for though it is sufficiently sheltered from wind and sea, yet the rocks, in different parts of it, render the passage in or out very hazardous; every danger in it is pointed out by rock weed, but it is so much straitened as to require the utmost vigilance. Even the best channel is narrow and tortuous, the depth from 12 to 16 fathoms, stones. At the bottom is an islet, forming two narrow channels, leading into a port or basin, two cable's length wide; the eastern channel is the deeper, and has 15 to 20 fathoms. Inside the basin, on the east side, the depth is 6 and 9 fathoms, mud. A reef extends for half a cable's length to the westward of the south end of the islet; it would be difficult and dangerous to enter this small basin.

Then follows a deep and extensive channel of which nothing is known, excepting that it extends to the south for 5 or 6 miles, and, perhaps, is very similar in its termination to Snowy sound,—it is Sarmiento's SNOWY CHANNEL. To the westward of Snowy channel are several inlets, affording, apparently, good shelter, but those examined were found to have very deep water.

ABRA OF SARMIENTO is a great bay, which trends into the land in a W. S. W. direction for more than two leagues, and has an island at its mouth. Within it appeared to take, first, a South, then a S. W. course, and afterwards to trend round a projecting, low, hummocky point of the east shore, and wind under the base of a high precipitous ridge on the opposite, or west shore, towards the S. E., beyond which its course could not be observed.

Opposite to Snowy channel is CAPE NOTCH, a projecting point of grey coloured rock, about 650 feet high, having a deep cleft in its summit; it is a conspicuous headland, and cannot be mistaken. The next place, to the westward, that can be recommended for an anchorage is Playa Parda cove, which is well sheltered, and, for chain cables, has a good bottom, being of sandy mud, strewed with stones; it is half a mile wide at the entrance, and about a quarter deep. Round the west side of Middle point is a channel a quarter of a mile long, and 150 yards wide, with a very excellent little harbour for a small vessel, of about a quarter of a mile in diameter.

Playa Parda cove is easily known by SHELTER ISLAND, that fronts the inlet of Playa Parda; the inlet is one mile and a half long, and half a mile broad, but with very deep water all over. By luffing round the island a ship will fetch the anchorage in the cove; and, although sail should not be reduced too soon, yet the squalls, if the weather be bad, blow down the inlet of Playa Parda with great violence. Anchor a little within, and half-way between the points of entrance, at about one cable and a half from the Middle point, in 5½ and 6 fathoms.

Of GLACIER BAY, remarkable for a glacier at the bottom, and of another bay to the eastward of it, nothing is known; the former may possess good shelter and perhaps anchorage, but the latter is too full of islands to be recommended. Between Glacier bay and Playa Parda the shore is bold but straight, excepting a small cove about two miles from Playa Parda, which seemed likely to afford shelter for small vessels. Off the west inner point is a reef, but within it there seemed to be a basin half a mile deep.

Marian's Cove is a convenient anchorage, lying one mile and a half to the west of Playa Parda; at the entrance it is about one-third of a mile wide, and more than half a mile deep. In entering the west side should be kept aboard; the anchorage is 22 fathoms, good holding ground; but less water may be obtained, if required, there being 8 fathoms within 60 yards of the beach, at the bottom of the bay. From Cape l'Etoile to the entrance of the Gulf of Xaultegua, the shore is straight and precipitous, and the hills are barren and rocky.

On the opposite shore there are a few inlets, but the most useful one for the navigator is Half Port Bay, rather more than a league to the east of Cape Monday. It is immediately round the south side of a deep inlet, and is an excellent stopping place; the anchorage is within two-thirds of a cable's length of the west point, in 16 fathoms, muddy bottom. On the S. W. side of the anchorage the land is high and thickly wooded, from its summit to the water's edge; that on the eastern side is lower, the vegetation more scanty, and the trees crooked and stunted, and pressed down to the N. E. by the prevailing winds. S. W. by W. from the anchorage is a remarkable cleft in the summit of the highland, from which a narrow stripe, cleared of jungle, descends to the water's edge; the anchorage is well sheltered from prevailing breezes, and the holding ground is good: water and fuel are abundant.

There is anchorage for small vessels under Cape Monday, with the exception of a shoal in the midway of the entrance, on which there are 4 fathoms; it seems to offer good shelter from the prevailing winds. On the west side of Cape Monday is Medal Bay, having an island in the entrance which forms two channels, the easternmost of which is only deep enough for boats, but the western is 25 fathoms wide; it is strewed half-way across with kelp, but between the kelp and the island is a good and clear passage with 6 fathoms, sandy bottom. In the kelp there is not less than 4 fathoms, and inside it the depth is 9, 8, and 7 fathoms, sandy bottom. To enter this port there are no dangers that are not visible, and those are easily avoided; they consist only of the islet in its entrance, and some patches of kelp, over which, however, there is plenty of water.

The Gulf of Xaultegua is a deep opening, trending into the land in an easterly direction for 28 miles, and approaching within two miles of some of the inlets on the N. W. side of Indian sound; the entrance is about 4 miles across, but afterwards expands to a width of nearly 15 miles. At the entrance is St. Ann's island, between which and the south point is a navigable channel, half a mile wide. St. Ann's island is about two miles long, and extends in a W. N. W. and E. S. E. direction; off its N. W. end is an islet, and there is another close to its S. W. extremity; the land forming the north side of the strait, between the Gulf of Xaultegua and the Jerome channel, is called Croker peninsula.

Tides. Little has been said of the tides in this part of the strait, and, indeed, as to their rise and fall, they are really of no importance, being little more than 4 feet. It is high water, at full and change, in all parts within a few minutes of noon. The current sets constantly to the eastward with more or less strength.

Sea Reach. A league to the westward of Cape Monday is an inlet, named Puerto Angosto; upon its west head is a conspicuous round mount, and to the north, between the mount and a projecting point, is a confined but very snug and commodious cove for a small vessel, in 17 fathoms, at a quarter of a mile within the head. Of Upright Bay little is known; Captain Stokes says, "We anchored at a cable's length off a small patch of light coloured shingle beach, situated on the west side of the bay, in 22 fathoms, sandy bottom. The anchorage, though affording excellent shelter from the prevailing winds, is bad with a southerly one, for the steepness of the bottom requiring a vessel to anchor close to the shore, sufficient scope is not left for veering cable.

CAPE UPRIGHT bears due south 5 miles from Cape Providence; it has a rocky islet a quarter of a mile off its east extremity, surrounded by kelp, which also extends for some distance from the cape towards the islet, at the end of which there are 7 fathoms. CAPE PROVIDENCE is a rugged rocky mountain, higher than the adjacent coast; it is deeply cleft at the top, and, when bearing about north, the western portion of its summit appears arched, the eastern lower and peaked. When the cape bears E. by S., distant about one league and a half, a little round rocky islet will be seen open of it, about one quarter of a point of the compass more southerly. There are some anchorages on the right, to the N. E. of Cape Providence, but they are too much out of the way, as well as very open and exposed to southerly winds to be of use, or to offer any security to vessels bound through the strait.

The distance from Cape Providence to CAPE TAMAR is 9½ miles; in this space the land arches inwards, and forms a bay about a league and a half deep. On the western side of Cape Providence are several islands, of which two are conspicuous; they are round and of a good height, and well wooded,—at a distance their form is conical, the eastern being the lowest. Between them is a passage to two good anchorages, which Lieut. Skyring, who examined them, considered even more sheltered than Tamar harbour.

Four miles to the eastward of Cape Tamar is ROUND ISLAND, to the N. W. of which is a well sheltered anchorage, but with deep water. In standing in pass midway between Round island and an island to the westward, which lies close to the shore, and haul round the latter to the mouth of a cove, in the entrance of which, near the south shore, there are 23 fathoms, sand. The shore to the North and N. E. of Round island is very rocky. On the east side of the promontory of Cape Tamar is the useful and excellent anchorage of TAMAR HARBOUR; it is scarcely two miles wide, and rather more than half a mile deep. Its entrance is not exactly free from danger, but with attention to the following directions, none need be apprehended. There is a sunken rock between a group of rocky islets, one-third over on the western ride, and a patch of kelp, one-third towards the eastern side of the bay. With a westerly wind it would be advisable to give the outer rock a berth of two cable's length to avoid this danger, on which there are only 9 feet of water, and upon which the Beagle struck. An excellent leading mark for this shoal is a whitened portion of a bare rock, looking like a tombstone, about one-third of the way up the green side of the mountainous land that forms the coast of the bay. This stone bears N. 76° W. (by compass) from the rocks to be rounded on entering the anchorage.

The least water found among the kelp, on the east side of the channel, was 4½ fathoms, and near and within the edge towards the rocky islets there are 7 fathoms; so that with the lead in hand, and a look-out for kelp, which should not unnecessarily be entered, there is no real danger to be apprehended,—the Beagle anchored at about one-third of a mile from the back of the bay. High water, at full and change, at 3 h. 5 m., and the perpendicular rise and fall is 5 feet. The flood tide, on this part of the northern shore of the strait, sets to the eastward, and rarely exceeds half a mile an hour.

TAMAR ISLAND lies to the westward of Cape Tamar; it is high, and separated from the land of the cape by a deep channel, from half to one mile wide. Half a mile off its S. W. end is a rock. Between Capes Tamar and Phillip, a space of 4 leagues, there is a deep bight, with two openings, the easternmost, in which are GLACIER and ICY SOUNDS, extends to the N. E. for 10 miles from the mouth, and the westernmost is the commencement of Smyth's channel. The rocks, called the Stragglers, extend to a considerable distance to the S. W., as far as three miles within the line of bearing between Cape Philip and Tamar island.

SHOLLS BAY is situated under the lee (the N. E.) of Cape Phillip; in it is excellent anchorage, in 15 fathoms. It is valuable for vessels working through the strait to the westward, inasmuch as, from the discontinuous nature of the northern shore (which here is formed into deep bays) this place will be much more easily recognized than the anchorages on the opposite coast; besides the winds hang here, in general somewhat to the northward of west, hence a better starting place for the westward is obtained. Here water and fuel are easily procured.

The coast on the south side, between Cape Upright and Valentine harbour, is little known; there are several deep bights and spacious bays, which may contain anchorage, but, in general, they are not found in the large harbours, which are mostly deep, precipitous chasms or ravines in the rock. The smaller coves, or where the land shelves down to the sea, are more likely to afford anchorages. VALENTINE HARBOUR seems to be commodious and secure, and of easy approach. On hauling round the island there are some islets half a mile off which must be avoided, but otherwise there seems to be no dangers; the anchorage, as a stopping place, is in from 20 to 26 fathoms, sand, at nearly a quarter of a mile from either shore: a more sheltered situation may be obtained to the S. W.

CAPE CUEVAS, the extremity of an island that is close to the shore, is in latitude 52° 53′ 19″ S., and longitude 74° 17′ 30″ W. Between it and Cape Valentine the coast forms a bay with islands in it. To the westward, also, of the cape, the coast is broken, and forms some sinuosities. One league N. W. ½ W. from Cape Cuevas, is the east part of TRUXILLO BAY which is 1¾ miles wide, in the direction of N. W. and S. E., and half a mile deep. At the bottom there is a port with an entrance half a mile across, bearing nearly North and South. It is a well sheltered port, trending W. S. W. for one mile and a quarter, with two small basins at the bottom; the depth is very great, but close to the west shore there are 8, 10 to 13 fathoms, on sand and coral. Near the mouth the depth is great, and generally of stones. There are several banks buoyed by sea weed, but in none was there less than 7 fathoms of water. There is plenty of wood and water in Truxillo bay, but nobody ought to visit it in preference to TUESDAY BAY, or rather the more convenient anchorage of TUESDAY COVE, situated three-quarters of a mile south of Cape Cortado; the anchorage is in 12 to 14 fathoms. Tuesday bay is larger, and, therefore, more exposed to the squalls, but for a ship, perhaps, might be more convenient.

On the north shore of the strait, opposite to Cape Cortado, is CAPE PARKER, a remarkable projection with three hummocks on the summit of the high land which rises over it. To the eastward the coast trends deeply in to the north, forming a bay, the eastern head of which is Cape Phillip, distant 9 miles. There appeared to be several islands in the bay, and at the bottom a narrow opening, perhaps a channel, leading to the north. On the west side of the bay the coast is indented, and affords some anchorages, but the approach is not clear. The first bay, however, to the eastward of the S. E. trend of the cape seems to afford a good stopping place; but it is fronted by a considerable shoal, with two rocky islets; the depth is from 7 to 22 fathoms.

To the westward of Cape Parker commences a range of islands, rocks, and shoals, fronting a broken coast that should never be be approached but for the purpose of discovery, or seal-fishery. The easternmost island is WESTMINSTER HALL, a high rocky island; and there are two or three conspicuous points such as the *Cupola and Observation Mount*, that might be noticed. SIR JOHN NARBOROUGH'S ISLANDS consist of 8 or 10 principal islands, and an innumerable number of smaller ones; amongst them are several anchorages, but none to be recommended, especially when on the south coast there are two or three much better, safer, and of easier access. It is a dangerous coast, as well from the immense number of rocks, upon which the sea breaches very high, as from the tides, which near the edge of the line of shoals set frequently in amongst them.

On the south shore of the strait is Cape Cortado, and a league to the westward is SKYRING HARBOUR; its entrance is one mile and a quarter wide, narrowing to half a mile, trending to the S. W. by W. for one mile and a half, and then terminates in a cove extending half a mile to the S. E. with 10 fathoms in it. There are some islands in it, and anchorage might be obtained in 27 fathoms. At three miles and a half from the west point of Skyring harbour, is the east head of the HARBOUR OF MERCY, one of the best anchorages of the western part of the strait, and being only four miles within Cape Pillar, is very conveniently placed for a ship to anchor at, to await a favourable opportunity for leaving the strait; there is no danger in entering, the depth is moderate, 12 to 14 fathoms, and the holding ground excellent, being a black clay. A ship may select her position, but the one off the first bight round the point being equally well sheltered, and much more convenient for many purposes, is the best berth.

Three miles to the westward of the largest Observation islet, is CAPE PILLAR, upon which landing was obtained on the 25th February, 1827, but not without considerable difficulty, owing to the great swell that then, and indeed always, prevails near it. The extremity of the cape is in latitude 52° 42′ 53″ S., and longitude 74° 39′ 31″ W.; and CAPE VICTORY in latitude 52° 16′ 10″ S., and longitude 74° 50′ 55″ W. These points form the western entrance of the strait.

THE EVANGELISTS, OR THE ISLES OF DIRECTION, are a group of rocky islets, consisting of four principal ones, and some detached rocks and breakers. The islands are rugged and barren, having anchorage round them, if necessary; the largest and highest may be seen in tolerably clear weather, from a brig's deck, at the distance of 7 or 8 leagues. The southernmost, from its shape called the Sugar-loaf, is in latitude 52° 14′ 18″ S., and longitude 75° 2′ 56″ W. From the Sugar-loaf, the extremity of Cape Pillar, it bears N. W. ¾ N., 23½ miles, and from Cape Victory S. W. ¼ S., 11 miles.

DIRECTIONS FOR PASSING THROUGH THE STRAIT OF MAGALHAENS FROM THE ATLANTIC TO THE PACIFIC. In the eastern entrance, the winds will frequently favour a ship's arrival off the First Narrow, where, if she selects a good anchorage on the bank which bounds the northern side of the channel, she may await an opportunity of passing through the FIRST NARROW, and of reaching GREGORY BAY; where also a delay may safely be made for the purpose of passing the SECOND NARROW, and arriving at the neighbourhood of CAPE NEGRO, at which places the difficulties and dangers of the eastern entrance cease. The dangers being sufficiently described in the preceding pages, nothing need be repeated here, and indeed much must be left to the judgment and discretion of the navigator.

The TIDES answer best for vessels entering the strait at the period of full and change of the moon, since there are two westerly tides in the day. In the winter season, if the morning tide be not sufficient to carry a vessel through the First Narrow, she may return to Possession bay, select an anchorage, and be secured again before night; or, in the summer, if she has passed the Narrow, and enabled to anchor for the tide, there will be sufficient daylight for her to proceed with the following tide to Gregory bay, or at least to a safe anchorage, off the peaked hillocks on the north shore. Captain King says, "I have twice attempted to pass the First Narrow, and been obliged to return to the anchorage in Possession bay, and twice I have passed through it, against a strong breeze blowing directly through, by aid of the tide, which runs, in the narrower parts, at the rate of 10 or 12 miles an hour." When the tide and wind are opposed to each other the sea is very deep and heavy, and breaks high over the decks; it is therefore advisable to close reef, or lower the topsails on the cap, and drift through, for the tide, if at the springs, will generally be sufficient to carry a ship to an anchorage, although not always to one that it would be safe to pass the night at. On this account it would be prudent to return, for, although the holding ground is exceedingly good, yet to part in the night, or drift towards or through the narrow, could scarcely happen without accident.

In leaving the anchorage in Gregory bay, attention must be paid to the tide, which continues to run to the eastward, in the SECOND NARROW, three hours after it has commenced to set to the S. W. at the anchorage. With a leading wind through the Second Narrow a ship will easily reach an anchorage off Lared's bay; but, if the tide fails upon emerging from it, she should seek for a berth in the bay to the north of Elizabeth island, as near to the island as possible, but to the westward of its N. E. end, to be out of the influence of the tide. The depth of water, however, will be the best guide.

The only advice that seems wanting to improve the directions of the coast from this to PORT FAMINE is with a south-westerly wind to keep close to the weather shore, in order to benefit by the flaws down the valleys; but this must be done with caution, in consequence of the squalls off the high land, the violence of which, to a person unaccustomed to them, cannot be well imagined. The anchorages between Port Famine and Cape Froward are sufficiently described (in pages 346 to 349) of which the only convenient one for a ship is St. Nicholas bay, and to which, if defeated in passing round the cape, a ship had better return, for it is easy to reach as well as to leave, and extremely convenient to stop at to await an opportunity of proceeding.

From CAPE FROWARD to the westward, unless favoured by a fair wind, it is necessary to persevere and take advantage of every opportunity of advancing step by step. There are several anchorages that a ship may take up, already described between pages 349 and 351. To the westward, in CROOKED REACH; the anchorages are not so good, and, excepting Borja bay, none seem to offer much convenience. BORJA BAY, however, is well calculated to supply the deficiency, although for a square-rigged vessel there must be some difficulty in reaching it. LONG REACH is both long and narrow, and ill supplied with anchorages for a ship; such as they are, Swallow harbour, Playa Parda, Marian's cove, and Half Port bay, seem to be the best. In SEA REACH there is a heavy rolling swell, with a short and deep sea, which render it very difficult to beat to windward. Tamar harbour, Valentine harbour, Tuesday cove, and the Harbour of Mercy, are the best anchorages;* and the latter is particularly convenient to occupy to

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* For a description of them look to page 356, and the two following pages.

3 36 By

await an opportunity of sailing out of the strait. In the entrance the sea runs very heavy and irregularly during and after a gale, so that a ship should not leave her anchorage, in the Harbour of Mercy, without a fair or leading wind, to get her quickly through it.

For small vessels, particularly if they be fore-and-aft rigged, many, if not all the local difficulties vanish; and inlets which a ship dare not or cannot approach, may be entered with safety, and anchorage easily obtained by them. A large ship will perhaps be better off, in entering and leaving the strait, where there is open space and frequently a heavy sea; but, for the navigation of the strait, a small vessel has considerably the advantage. She has also the opportunity of passing through the Cockburn channel, should the wind be north-westerly, which will very much reduce the length of the passage into the Pacific.

One very great advantage to be derived from the passage through the strait is the opportunity of obtaining as much wood and water as can be required, without the least difficulty; another great advantage is, that by hauling the seine during the summer months, from January to May, at the mouth of the river or along the beaches in Port Famine, at the first quarter flood, a plentiful supply of fish may be obtained. Excellent fish are also caught at the anchorage, with the hook and line, at all seasons, early in the morning or late in the evening. Fish may also be obtained with the seine at any other place where there are rivers. Freshwater bay and Port Gallant are equally productive.

Directions for passing through the Strait of Magalhaens, from the Pacific to the Atlantic. The advantage which a ship will derive from passing through the strait from the Pacific to the Atlantic, for there must be some great one to induce the seaman to entangle his ship with the land, when fair winds and an open sea are before him, is very great. After passing through the strait, the prevailing winds being westerly, and more frequently from the northward than from the southward of west, they are fair for his running up the coast; or, if not, the ship is not liable to receive much injury from the sea, which is comparatively smooth; whereas, to a ship passing round the Horn, if the wind be N.W. she must go to the eastward of the Falkland islands, and be exposed to strong gales and a heavy beam sea, and hug the wind to make her northing. To a small vessel the advantage is incalculable, for, besides filling her hold with wood and water, she is enabled to escape the severe weather that so constantly reigns in the higher latitudes of the South Atlantic Ocean.

Coming from the northward it will be advisable to keep an offing until the western entrance of the strait is well under the lee, to avoid being thrown upon the coast to the northward of Cape Victory, which is rugged and inhospitable, and, forming as it were a breakwater to the deep rolling swell of the ocean, is for some miles off fringed by a cross hollow sea, almost amounting to a rippling.

The land of Cape Victory is high and rugged, and much broken; and, if the weather be not very thick, will be seen long before the Evangelists, which are not visible above the horizon, from a ship's deck, for more than 4 or 5 leagues. Pass to the southward of them and steer for Cape Pillar, which makes like a high island. In calm weather do not pass too near to the cape, for the current sometimes sets out, and round the cape to the southward; but with a strong wind get under the lee of it as soon as you please, and steer along the shore. In the night it will be advisable to keep close to the land of the south shore, and, if a patent log be used, your distance will be correctly known. The course along shore, by compass, is [illegible] £462 - 10 - 3 [illegible]

E. $\frac{3}{4}$ S., and, if the weather be thick, by keeping sight of the south shore there will be no difficulty in proceeding with safety.

In the summer season there is no occasion to anchor anywhere, unless the weather be very tempestuous, for the nights are short and hardly dark enough to require it, unless as a precautionary measure, or for the purpose of procuring wood and water, the best place for which is Port Famine, where the beaches are strewed with abundance of logs of well seasoned wood, which is very superior to the green wood that must otherwise be used.

There is, generally, a current setting to the eastward, which is more or less felt, according to circumstances. The direction and strength of the currents are caused by the duration of the gales.

The chart will be a sufficient guide for vessels bound through from the westward, as far as Laredo bay, after which a few directions will be necessary. The land here should be kept close on board, to avoid the reef off the S. W. end of SANTA MAGDALENA. Being abreast of it, bear away, keeping the N. E. extremity of Elizabeth island on the starboard bow, until you see SANTA MARTHA in one with, or a little to the southward of, the Second Narrow (CAPE ST. VINCENT) which is the leading mark for the fair channel, until you pass the spit of shoal soundings, which extends across to Santa Magdalena. There are also shoal soundings towards the S. W. end of Elizabeth island; at half a mile off we had 5 fathoms,—Cape St. Vincent being then the breadth of Santa Martha, open to the northward of that island. Keeping the cape just in sight to the northward of Santa Martha, steer on and pass round the low N. E. extremity of Elizabeth island, off which are several tide eddies. The tide here sets across the channel.

Now steer for the SECOND NARROW, keeping Cape Gregory, which will be just discernible as the low projecting extreme of the north side of the Second Narrow, on the starboard bow, until you are three miles past Santa Martha; the course may then be directed for the cape, opening it gradually on the larboard bow, as you approach it, to avoid the shoal that extends off it.

If you anchor in GREGORY BAY, which is advisable, in order to have the whole of the tide for running through the First Narrow, haul up and keep at a mile and a half from the shore, when the north extremity of the sandy land of the cape is in a line with the west extreme of the high table land, you will be near the anchorage, then shorten sail, and, when the green slope begins to open, you will have 14 fathoms; you may then anchor, or keep away to the N. E., and choose a convenient depth, taking care not to approach the shore so as to bring Cape Gregory to the southward of S. by W. $\frac{1}{4}$ W. (by compass.) The best berth is with the cape bearing S. S. W.

Hence to the FIRST NARROW the course by compass is due N. E. by E. The land at the entrance being low, will not at first be perceived, but on steering on you will first see some hummocky land, making like islands. These are hills on the eastern or Fuegian side of the Narrow. Soon afterwards a flat, low sand-hill will be seen to the northward, and this is at the S. W. extremity of POINT BARRANCA. On approaching the Narrow at 4 miles off, keep a cliffy head 4 or 5 miles within the east side of the Narrow, open of the trend of Point Barranca, by which you will avoid the shoal that extends off the latter point; you should not go into less depth than 6 fathoms. At most times of the tide there are long lines and patches of strong ripplings, through which you must pass. The shoal is easily distinguished by the kelp.

When the channel through the narrows bears by compass N. by E. $\frac{3}{4}$ E. steer through it, and that, or a N. N. E. course, will carry you through. On each side the bank extends off for some distance; but by keeping in mid-channel there is no danger until the cliffy coast be passed, when reefs extend off either shore for some distance, particularly off Cape Orange. The N. N. E. course must be kept until the peak of Cape Orange bears S., and the northern Direction hill W. S. W. or W. by S. ½ S. by compass; then steer E. N. E. for Cape Possession, taking care not to approach too near to the bank off Cape Orange, or the one on the north side of Possession bay.

For a small vessel the passage through the strait from west to east is not only easy but to be strongly recommended as the best and safest route. Indeed, it is thought that the passage would be quite as expeditious, and, perhaps, much safer to enter the Gulf of Trinidad, and pass down the Concepcion strait, the Sarmiento, or St. Estevan channels, and Smyth's channel, and enter the strait at Cape Tamar In these channels northerly winds prevail, and there is no want of convenient and well sheltered anchorages for the night, many of which have already been mentioned, and multitudes of others, and perhaps much better ones, might be found.

TIERRA DEL FUEGO.

CAPE PILLAR TO CHRISTMAS SOUND. In making the land and approaching the strait a ship should keep well to the northward of Cape Pillar, and should, indeed, close the Evangelists, unless the wind has southing, because there is a strong current which sets across the entrance of the strait, directly towards the dangerous cluster of rocks, called the Apostles and Judges. It follows the trend of the coast, and would set a ship many miles to the southward of Cape Pillar, if she stood in for it without making proper allowance. It runs from one to two miles an hour, according to the winds that are or have been prevalent.

Close to Cape Pillar are two small rocks, called the Launches; they are not more than three cables' length from the shore. The cape and the shore on each side are steep-to; off the cape, at two miles distance, are 60 and 70 fathoms, fine sand.

Proceeding along the outer, or S. W. coast, the APOSTLE and JUDGE ROCKS show themselves; there are some from 5 to 50 feet high above the water, but many breakers show near them, and indicate an extensive reef. The outer rock is 4 miles from the land. Eleven miles from Cape Pillar is DISLOCATION HARBOUR, a place of refuge for an embayed or distressed ship, but unfit for any other purpose; its entrance is rendered difficult to the eye, by rocks, on which the sea breaks violently, and by two rocks under water, on which the sea does not *always* break. The place of Dislocation harbour is pointed out by the heights, called LAW and SHOULDER PEAKS; they are the most remarkable on that part of the coast, and immediately over the harbour.

To find the entrance, steer for the peaks, look out for the weather and lee rocks, both several feet above water, the sea breaking violently on them; and when within four miles of the shore you will distinctly see the opening from the mast-head. In going in, avoid the two rocks at the entrance, and anchor in the innermost part; only a small ship can get out again without a fair wind. The prevailing winds send in a swell, but the place is quite secure. Water may be obtained very easily; the boats can lie in a stream which runs from the mountains, and fill alongside; wood is plentiful; four small vessels may lie in security; the bottom is very even, 15 to 25 fathoms, fine white sand.

The entrance is narrow, exposed to the prevailing wind and swell, which might, for days together, prevent a vessel from getting out to sea. Two miles from Dislocation harbour is Cape Deseado, the highest land hereabout, and remarkable; a rocky islet lies one mile off shore. From Cape Deseado the coast runs high and unbroken for about two miles, then there is an opening not examined. Several islands succeed for a space of two miles, after which you open Barrister Bay, an exposed place, full of islets, rocks, and breakers, and unfit for any vessel.

Cape Sunday is the next headland; it is high and prominent; two islets and two dangerous rocks lie off it. This cape is on one of a cluster called the Week islands. At their south side is a roadstead, with good holding, in 18 or 20 fathoms, coarse gravel and sand, with patches of rock. It is exposed to southerly winds and to those from the west, therefore it is not advisable for a vessel to anchor there. Between the islands is a snug berth for a small vessel, quite secure, but difficult of access. The eye must be the chief guide in entering most of these places; they are of one description,—inlets between high land, having generally deep water, with kelp buoying the rocky places. Flaws of wind and violent gusts off the high land render the approach to them difficult, and, to a large ship, impracticable.

Landfall Islands lie six miles south of the Week islands. Between the islands is a snug berth for a vessel not drawing more than 12 feet, in perfect security, smooth water; and a vessel should not moor in less than 10 fathoms, as close to the west shore as possible, with an anchor to the eastward, in the event of the wind blowing from that quarter. Water and wood are plentiful. Cape Inman, a remarkable headland, is at the western extremity of the Landfall islands. Off it are several detached rocks, on which the sea breaks violently, and gives them a formidable appearance; the outermost one is not two miles from the shore, and shows itself plainly. Behind the island, of which Cape Inman forms the most conspicuous part, is Latitude Bay, an anchorage decidedly good, though somewhat exposed to a swell thrown in by heavy N. W. winds. Cape Schetky is a remarkable double-peaked height, at the south extremity of the Landfall islands; some rocks just awash lie off it, distant one mile. The *true* course along shore, after giving the Apostles a proper berth, is S. 29° E., as far as the latitude of Cape Tate, the southern limit of Otway bay.

Otway Bay lies to the eastward of the Landfall islands: it is an extensive space of water, surrounded by broken land, islets and rocks; many of the latter are scattered about, and render it unfit for any vessel. It is probable that passages lead hence to the Straits of Magalhaens, as deep inlets run, in that direction as far as the eye can reach, from the Landfall islands. Off Cape Tate, which is rather high and rounded at the summit, are several clusters of rocks, called the College Rocks; they are only seen when near the land.

The Fincham Islands next are noticed in passing along shore. There are many islets and rocks near, and very many scattered between the islands and Cape Tate. There is no good anchorage hereabout; the coast is very dangerous, and unfit to be approached. H. M. S., Beagle tried to anchor in Deep Water Sound, but failing to find a proper depth of water, was obliged to drop her anchor upon the shelving end of a small island, being too far up the sound to get out again before dark. Between the Fincham islands and Cape Gloucester is Breaker Bay, a large wild place full of rocks and breakers, and exposed to all the strength of the west winds; it is a most unfit place for the approach of a vessel. The surrounding coast is broken into islands, islets, and rocks almost innumerable.

Cape Gloucester is a very remarkable promontory, and cannot be mistaken. At a distance it appears to be a high detached island, but, on a nearer approach, a low neck of land is seen, which connects it with the largest of the Grafton islands. A rock, on which the sea breaks, lies nearly one mile to the N. W.; there is no danger. The cape may be passed quite, being steep-to. It is a guide to Euston Bay, one of the best anchorages on this coast; one which can be approached and left with any wind, without risk, and in which a fleet may lie in perfect security from all but the S. E. winds, the least prevalent on this coast. The Grafton Islands extend about 20 miles in a S. E. direction from Cape Gloucester; between them are several anchorages, but the best and easiest of access is Euston bay. Passing Cape Gloucester you see a high island to the S. E., distant 7 miles; this is Ipswich Island. Between it and Cape Gloucester is a bay, in which are many rocks and breakers.

Rounding Ipswich island, you must give a good berth to the rocks under water, which lie one mile from its S. E. extremity; the sea generally breaks upon them. After clearing these rocks, pass close to Leading island, and steer for the opening of Laura Basin, which you will see under a high peaked mountain. In it there is water for a frigate, but it is better suited to a small vessel. Large ships should anchor in the bay, and, as the bottom is even and good, and the bay capacious, exposed only to S. E. winds, which come on gradually and blow hard, it may be considered a fit place for ships of any size. Wood and water are plentiful, and easy to be obtained. The depth of water in the bay varies from 5 to 20 fathoms, the bottom generally fine speckled sand. A large patch of kelp lies across the entrance of the harbour, but there is no danger beneath it, except for a line-of-battle ship, as in one spot there are 4 fathoms only.

Noir Island is of moderate height, about 600 feet above the sea, and having a remarkable neck of land to the S. W., ended by a rock like a steeple or tower. One mile south of this point is a sunken rock, over which the sea occasionally breaks; two other breakers are in the bight, close to the point. There is an excellent roadstead under the east side of Noir island. Several ships may lie there secure from all winds between north and south by the west, over a clear sandy bottom. Wood and water are plentiful, and easily obtained. There is a cove at the south part of the island, where boats would be perfectly safe in any weather, but the entrance is too narrow for vessels of any kind. The large space between Noir island and the Agnes Islands is extremely dangerous for shipping, being scattered with rocks, some just awash, many shewing themselves several feet *above*, others *under* water. Still there is abundant room to go round the island, in perfect security, therefore, no ship need fear being hampered by an east wind, in the event of anchoring in Noir roads. A rock lies in the roads, and another, a very dangerous one, four miles to the eastward.

Seven miles south of Noir island are the Tower Rocks; they are high, quite steep-to, and a ship may pass close to either side of them.

Between Noir island and Cape Schomberg, on London island, lie many reefs, and a great number of detached outlying rocks, which render this part of the coast extremely dangerous, and unfit for vessels. No chart could guide them; they must trust to daylight and clear weather, with a good look-out, if necessary, to enter or leave the Barbara channel, which opens into this bay.

The Agnes Islands, and those in their neighbourhood, do not require any description. They are so fortified by outlying rocks, as not to be fit places for the approach of any vessel. Northward of them is Stokes Bay, and to the eastward a number of islands, between which is the Barbara channel. No vessel ought to entangle herself in these labyrinths; if she does, she must sail by eye. Neither chart, directions nor soundings, would be of much assistance, and, in thick weather, her situation would be most precarious.

Between Noir and Kempe islands is the MILKY WAY, a space of sea, in every part of which rocks are seen just awash with, or a few feet above, the water; on them the sea continually breaks.

There are soundings over all the tract of sea between Noir and London islands, seldom exceeding 60 fathoms, and near the rocks diminishing to 20, 15, and 10.

LONDON ISLAND is one of a large group called the Camden islands; at its east end is a safe anchorage called TOWNSHEND HARBOUR. The Horace peaks point out its situation. Some rocks, on which the sea breaks violently, lie off the islands, and near the entrance of PRATT PASSAGE. As there are no soundings in less than 50 fathoms after passing these rocks, and getting into the passage, you must depend upon the wind lasting to carry you into, or out of, the harbour. The holding ground in it is excellent, and though you have tremendous squalls off the high land to the westward, there is no fear of an anchor starting. BRECKNOCK PASSAGE is wide and clear of all danger. In entering or leaving the Barbara channel by this way is preferable to passing by the Fury rocks. CAPE DESOLATION, the south point of Basket island, is a very remarkable headland, it is rugged, with many peaks. The next promontory which is approached, in passing along the coast, is CAPE CASTLEREAGH; it is high and remarkable. Between this and Cape Desolation is a large space of water, called DESOLATE BAY, leading to Courtney sound, Theive's sound, and Whale-boat sound. Rocks and breakers abound, and make these sounds quite unfit for shipping; no doubt small vessels might, in clear weather, traverse any of these passages, but it would always be with much risk, and should not be attempted without an adequate object.

Under Cape Castlereagh is an excellent anchorage, called STEWART HARBOUR; it is not large, but, for small vessels, is an exceedingly good place, being easy of access with any wind, having three openings. A vessel may anchor in the entrance and warp in; there is nowhere more than 16 fathoms, generally from 6 to 12. Wood and water are plentiful, and easily obtained. Two rocks lie nearly in the middle, just awash at high water. A rock, on which the sea breaks, lies one mile west of the middle opening to the harbour;—there is no other danger. Further to the S. E. are the GILBERT ISLANDS, off which, distant 8 miles from Cape Castlereagh, are the NICHOLSON ROCKS. Between the Stewart and Gilbert islands is ADVENTURE PASSAGE, an open space with deep water, clear of danger. At the north eastern side of the eastern Gilbert isle is DORIS COVE, a safe anchorage for a small vessel.

The LONDONDERRY ISLANDS are the next, they extend nearly to Christmas sound. TREBLE ISLAND is a remarkable height, having three peaks, it is visible from a considerable distance; near it are some straggling rocks. Nine miles S. 22° E. from Treble island are the PHILLIPS ROCKS, they are dangerous, though above water, because so far from the shore, and so low. COOK BAY is a large space between Alikhoolip and Waterman island. Broken land, islets, and breakers surround and make it unfit for the approach of vessels. At the N. E. is the entrance of the BEAGLE CHANNEL, and a passage to Whale-boat sound, both unfit for sailing vessels, excepting with a fair wind. WATERMAN ISLAND is soon known by the remarkable heights at its south part; the southernmost is named YORK MINSTER, from its fancied resemblance to that building; it is a wild looking rock. Eight miles west of York Minster, and five from Point May, are the CAPSTAN ROCKS, above water about 20 feet.

CHRISTMAS SOUND TO CAPE HORN. Hauling round York Minster you may enter CHRISTMAS SOUND. There is no hidden danger. ADVENTURE COVE is the easiest of access, but it will only hold one vessel. MARCH HARBOUR is large, with good holding ground, but there are many rocky places; and one rock, under water, having on it only one fathom; its situation is marked by very thick kelp. H. M. Ship Beagle worked through the narrow passage, round SHAG ISLAND, from Adventure cove, and worked into the innermost corner of the harbour, without using a warp; larger vessels would, of course, find themselves more confined. PORT CLERKE is a bad place for any vessel, though quite secure when in it; access is difficult, and, from its situation, it is exposed to very violent squalls. PICKERSGILL COVE, as an anchorage, is unworthy of notice.

Eastward of Christmas sound lie the WOOD ISLANDS, there is no good anchorage among them; passages and broken land lie behind them to the northward. Off POINT NATIVITY are two islands and an outlying rock. HOPE ISLAND is 6 miles to the S. E. of this point. The ILDEFONSOS, a large group of rocks and islets, are 35 miles distant from York Minster, and bear from that spot S. E. ¼ S.: they extend 5 miles in a N. W. and S. E. direction, are very narrow, and about 100 feet above the sea; you may pass close by them in a vessel, for there is no danger. Neither Trefuse's bay nor Rous sound afford anchorage.

LEADING HILL is a very remarkable double peaked height; beyond it are Duffs bay, Morton and Henderson islands, and the entrance of Indian sound; the latter is a large tract of water, extending to the N. W., it is full of islands. CLEARBOTTOM BAY is at the north end of Morton island, and a good anchorage. INDIAN COVE is not a place to be recommended to vessels; they must go far among the islands to reach it, and, when there, have a bad rocky bottom, with deep water. Many better anchorages may be attained on this coast, with less trouble. Between CAPE WEDDELL, at the east side of Indian sound, and FALSE CAPE HORN is a tract of broken land, which is, however, a lee-shore during S. W. and Southerly winds, and therefore unfit for anchorage.

On HENDERSON ISLAND is a high sharp-pointed hill, which is visible at a great distance. From its summit the DIEGO RAMIREZ ISLANDS were seen, though 50 miles distant. The highest point of these islands is about 150 feet above the sea. There is no hidden danger near them. They lie nearly north and south, and extend over a space of 5 miles. A ship may pass between the northern cluster and that to the southward. Detached rocks lie off the southern island; all the outer ones are above water. The southern, or BOAT ISLAND, has a cove at its N. E. corner, in which boats may land; there is water on the point close to the eastward of this landing-place.

FALSE CAPE HORN is a very remarkable headland, from the east or west it looks like a large horn. It is a leading mark to the best anchorage on this coast. ORANGE BAY.—To anchor in this bay you must pass to the eastward of the False Cape as close as you please. Steering N. E. *(true)* for 4 miles will bring you abreast of Point Lort; a bay two miles wide is then opened, in which you may anchor, if necessary, in 8 or 10 fathoms, over a fine sandy bottom. Some rocks, above water, lie at the north side. Beyond the point, which forms the north side of this bay, is a small cove, with 18 fathoms water in the middle; beyond it is another cove, rather larger, after which you open Schapenham bay; a north course *(true)* from Point Lort will take you abreast of Orange bay.

Schapenham Bay is one mile and a half wide; there is a small black rock, above water, rather to the northward of its middle. A great deal of kelp, lying over a rocky bottom, is seen at the head of the bay, and a large waterfall marks the place distinctly. There is anchorage in from 10 to 15 fathoms, near the south point, which is not to be recommended, when by going further a vessel may get into an unexceptionable harbour, or anchor off its entrance in perfect security.

The land behind these coves that have been mentioned is high and rugged; two singular peaks shew themselves, which resemble sentry-boxes. Near the shore the land is low, compared with other parts of the coast, and has not the iron-bound forbidding appearance of the more westerly shores. From the heights sudden and very strong squalls blow during westerly winds. Being generally a weather shore, and regular soundings extending along it, there is no difficulty in choosing or approaching an anchorage.

Off Orange Bay anchor soundings extends to two miles from the land. The opening of the bay is 3 miles wide, and in that part are 18 or 20 fathoms, over fine speckled sand. Two islands, the larger having a smooth down-like appearance, lie in the middle; behind them is the harbour, a square mile of excellent anchorage, without a single rock or shoal. In the two creeks at the south side is good anchorage for small vessels; the depth of water varies gradually from 5 to 20 fathoms. The bottom, every where, is a fine speckled sand. The land hereabouts is low, comparatively speaking, and you are not annoyed by the violent squalls which come from the heights in other places. Wood and water are plentiful; the best watering place is in a small cove at the north side, called Water Cove. Off the north point are several small islets, which must not be approached too closely; they are, however, out of the way. Six miles N. N. W. of the outer anchorage is a curious island, like a *Packsaddle.* Orange bay is somewhat open to the east winds, but they seldom blow strong, and would be fair for ships bound westward. No sea can be thrown in, because of the Hermite islands. There is no current here worthy of notice. The tide rises 6 feet; high water at half-past three.

Nassau Bay extends to the North and N. W. into the Beagle Channel. It is very accessible, and free from dangers. Anchorage may be found on each coast, and the only dangers are some rocks or islets above water, and visible at a distance by daylight. The northern shore is low, particularly towards Guanaco Point, where the coast first begins to shew signs of approaching.

Eastern Patagonia, changing its rocky heights for level land, and low earthy cliffs. In Nassau bay the compasses are much affected; they become very sluggish, and might cause a serious error, if not carefully attended to.*

Opposite to the land lying between New Year's and Tekeinika sound, called Hardy peninsula, are the Hermite Islands, on the southernmost of which is CAPE HORN. There is nothing very striking in the appearance of this promontory, as seen from a distance, but, in passing near, it is more remarkable, shewing high black cliffs toward the south; it is about 500 feet above the sea. No dangers exist to the southward, in approaching these islands.

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* Captain P. P. King says, "The magnetic needle was very remarkably affected in many parts of the islands of the group, although I did not observe any great difference when at a distance from the rock of which they are formed, or on board the ship. On one occasion, on ascending the summit of Maxwell island, in Port Maxwell, the compass was placed, for convenience, upon the rock, when the needle was found to be so much influenced by the ferruginous nature of the rock, composed of quartz, with large and numerous crystals of hornblende, that its poles became exactly reversed. An experiment was afterwards made, by taking a set of bearings of a distant object (to prevent an error of parallax) at several stations around, at 50 yards from the above magnetic rock, when the extreme difference amounted to 127°. The block upon which the compass was placed in the first instance, is now in the Museum of the Geological Society."

In the channel between False Cape Horn and the Hermite islands, a *current* is found setting into Nassau bay, and rather towards the Hermite islands, at the rate of two knots an hour, with the flood tide, and about half a knot with the ebb. As this current sets rather towards WEST CAPE, a good berth must be given to it in passing. A *strong current* sets, at times, along the outer coast of the Hermite islands, and through the Bay of St. Francis. It varies from half a knot to two knots an hour, according to the wind and the time of tide, and, in the bay, changes its direction with the change of tide.

The land about ST. MARTIN'S COVE is high and rugged. Temporary anchorage may be had in the small bay leading to ST. JOACHIM'S COVE, or under the south head of St. Martin's cove, where you find from 20 to 25 fathoms, over a clear sandy bottom. As you approach the western end of St. Martin's cove the water shoals to 15 and 10 fathoms. It is perfectly secure, but visited by very violent squalls during a westerly wind. Wollaston and Herschal islands have ridges of mountains. KATER'S PEAK, the highest land (excepting MOUNT HYDE) on the islands, is 1,700 feet above the sea.

PORT MAXWELL is a perfectly secure anchorage, but it is rather out of the way. Though it has four openings, only two are fit for vessels, those to the north and east. The best berth in it has 16 fathoms water, over a clear sandy bottom. This harbour is decidedly good, though it requires a little more time and trouble in the approach. The passages between these islands have deep water, and are free from dangers; what few rocks there are shew themselves above water, or are thickly covered with kelp. Some rocks lie off the south end of Chanticleer island, too close to be of much consideration.

CAPE HORN TO CAPE SAN DIEGO. One mile to the westward of Cape Horn there are three rocks, generally above water; the sea always breaks on them. Off the east point of HORN ISLAND are some small rocks and breakers. Off CAPE DECEIT are several rocks, all above water; and two miles to the S. E. is a cluster, rising 30 or 40 feet above the sea.

Off Cape Horn the *current* is as strong as on any part of the coast. Between it and Cape Pillar it is by no means regular; sometimes with a strong wind and flowing tide it runs two knots an hour, at others it is hardly worth notice; it never sets to the westward at any time of tide or with any wind.

The BARNEVELT ISLANDS lie 11 miles N. by E. from Cape Deceit. The space between Cape Deceit and New island, is said to be free from hidden dangers. In GOREE ROAD there is very good anchorage in 6 or 7 fathoms water, over a sandy bottom. LENNOX ISLAND as well as NEW ISLAND, and indeed any part of the coast hereabouts, may be approached with confidence, using the lead and looking out for kelp. There are no shoals, but the water is not so deep as to the west of Cape Horn, neither is the land near so high. At the east side of Lennox island is excellent anchorage; small vessels may go into a cove, but large ships must anchor in the road, which is quite secure, and sheltered from all but S. E. winds, with which, of course, a vessel would not wish to remain at anchor. To the north of Lennox island is the eastern opening of the BEAGLE CHANNEL; it is easy of access, but useless to a ship. Boats may profit by its straight course and smooth water. This channel averages 1½ mile in width, and in general has deep water; but there are in it many islets and rocks near them.

A range of high mountains runs uninterruptedly from the Barbara channel to Strait Le Maire,—Mount Sarmiento, more than 5,000 feet above the sea, is in this range. Southward of these mountains is a succession of broken land, intersected by passages or large sounds. A boat cannot go from the Week islands to the eastern entrance of the Beagle channel, without being once exposed to the outside coast, or to the sea which is there found.

Good temporary anchorage, during westerly winds, may be obtained under NEW ISLAND, or near the shore to the northward; but there is no good harbour, between Richmond road and Good Success, in Strait Le Maire; regular soundings are found hereabouts in all directions, and the shore is steep-to. Neither AQUIRRE BAY, SPANIARD'S HARBOUR, nor VALENTYN'S BAY are fit for more than temporary anchorage, during northerly or westerly winds. They are much exposed to the south.

The *tide* is felt strongly on this part of the coast, causing races and eddies near the projecting points. In the offing the current or tide sets towards Strait Le Maire, from 1 to 3 knots an hour, when the water is rising on the shore, and the wind westerly. While the water is falling it runs with less strength, and with an easterly wind is not felt at all.

The BELL MOUNTAIN is remarkable; it is seen far at sea, from the north as well as from the south; it is high, and in shape resembles a large bell. CAPE GOOD SUCCESS is high and bluff; some rocks lie close to it, above water. Rather more than two miles N. E. of Cape Good Success is a projecting headland, which, at first, appears to be a cape; two rocky islets shew themselves close to it, and, from a distance, appear like a ship under sail. Six miles from these rocks N. E. by N. is the BAY OF GOOD SUCCESS. It is a good anchorage, perfectly safe, provided that a vessel does not anchor too far in towards the sandy beach at its head; for, during S. E. gales, a heavy swell with dangerous rollers sets right into the bay. Heights of about 1,200 feet above the sea surround the bay, therefore, with strong winds, it is subject to squalls, which, during westerly gales, are very violent. The *Broad Road* is a good mark for the bay, if the inbend of the land does not sufficiently point out its situation. It is a barren strip of land, on the height at the south side of the harbour. MAURICE COVE has no good anchorage, it is merely a rocky bight. Hence to Cape San Diego the land is much lower, and the water near it less deep.

CAPE SAN DIEGO is low; a ship may go close to it. There are shoaler soundings towards the east, for about two miles, than in other parts near here, for a rocky ledge, under water, seems to project from the cape. On this ledge there are overfalls, strong eddies, and a violent race of tide when the wind is opposed to it. Beyond Cape San Diego the land suddenly trends away westward. CAPE ST. VINCENT is a rocky point, with low bluffs above it; between this point and Cape San Diego is THETIS BAY, a tolerable anchorage during west or southerly winds, though the bottom is rocky in many places. Between the heads the tides run with great strength, therefore a ship should anchor off a green bluff at the west side, and within the line of the heads she will have from 6 to 12 fathoms of water, over a coarse sandy bottom, mixed with patches of rock. Beyond Cape St. Vincent the land trends to the West and N. W.; it is rather low near the sea, but inshore are many hills partially covered with wood.

Between Cape Horn and Staten island regular soundings are found, between 30 and 70 fathoms, over a sandy bottom. The soundings in

STRAIT LE MAIRE are similar near their southern entrance; towards the north the soundings diminish; and, two miles from Cape San Diego, there are not more than 30 fathoms water, over a rocky bottom. The strait is clear of all obstacles, the tide excepted. The land, from Cape Good Success to Maurice cove, is high and bold, with water for a ship as near to it as she ought to go.

The *tides* in STRAIT LE MAIRE are as regular as in any part of the world. They will assist a vessel materially in her passage, if taken at the right time. As the strait is very wide, perfectly free from obstacles of any kind, the soundings regular, with Good Success bay close at hand, in case the wind or tide should change, vessels may pass through without difficulty or risk. When the tide opposes the wind and swell there is a heavy, and, for small vessels, dangerous race of tide off Cape San Diego, where, as before stated, there is a shoal ledge, and the tide runs very strongly.

It is high water on the shore in GOOD SUCCESS BAY, and slack water in the strait, at four in the afternoon, on the full and change days, and low water, with slack tide in the offing, at ten in the morning; the tide rises perpendicularly from 6 to 8 feet, according to the wind. At Cape Pillar the turn of tide is about one o'clock. Along the S. W. and S. E. coasts the time gradually increases to four in the afternoon at this place. From Cape San Diego to the northward the tide sets north and west along the shore, from one knot to three; the ebb sets in a contrary direction, but not so strongly.

In Strait Le Maire the flood tide runs from two to four knots near the Cape, and from one to three in mid-channel, more or less according to the strength and direction of the wind. The ebb sets to the southward, about one knot an hour. The flood tide sets through Strait Le Maire from the southward, and along the north and south sides of Staten island from east to west. It is high water, at full and change, at the anchorage within the New Year's isles, as well as on the east side of Strait Le Maire, at 5 o'clock. The current is very strong, running from 4 to 6 knots. Off Cape St. John there is a tide race, which extends for some distance off the point.

STATEN ISLAND is high, and its mountains are generally covered with snow. Its shores lying towards the strait is very bold and rugged. No danger is near them, excepting strong eddies and races, caused by the tide near the headlands.

CAPE ST. ANTONY, MIDDLE CAPE, and CAPE SAN BARTHOLOMEW are high bluff promontories. The soundings to the northward are very regular, and give notice of your approach to Staten island, or the Strait Le Maire.

REMARKS UPON THE PASSAGE ROUND CAPE HORN, by Captain P. P. King. "Ships bound from the Atlantic to any of the ports in the Pacific will find it advantageous to keep within 100 miles of the coast of Eastern Patagonia, as well to avoid the heavy sea that is raised by the westerly gales, which prevail to the eastward, and increase in strength according to the distance from the land, as to profit by the variableness of the wind when fixed in the western board. Near the coast, from April to September, when the sun has north declination, the winds prevail more from the W. N. W. to N. N. W. than from any other quarter. Easterly gales are of very rare occurrence, but, even when they do blow, the direction being obliquely upon the coast, I do not consider it at all hazardous to keep the land on board. In the opposite season, when the sun has south declination, the winds will incline from the southward of west, and frequently blow hard; but, as the coast is a weather shore, the sea goes down immediately after the gale. In this season, although the winds are generally against a ship's making quick progress, yet as they seldom remain fixed in one point, and frequently shift backward and forward 6 or 8 points in as many hours, advantage may be taken of the change so as to keep close in with the coast.

"Having once made the land, which should be done to the southward of Cape Blanco, it will be beneficial to keep it topping on the horizon, until the entrance of the Strait of Magalhaens be passed.

"With respect to this part of the voyage, whether to pass through Strait Le Maire, or round Staten island, much difference of opinion exists. Prudence, I think, suggests the latter; yet I should very reluctantly give up the opportunity that might offer of clearing the Strait, and, therefore, of being so much more to windward. With a southerly wind it would not be advisable to attempt the Strait, for, with a weather tide, the sea runs very cross and deep, and might severely injure and endanger the safety of a small vessel, and to a large one do much damage. In calm weather it would be still more imprudent (unless the western side of the Strait can be reached, where a ship might anchor) on account of the tides setting over to the Staten island side; where, if it becomes necessary to anchor, it would necessarily be in very deep water, and close to the land. With a northerly wind the route seems not only practicable, but very advantageous, and it would require some resolution to give up the opportunity so invitingly offered. I doubt whether northerly winds, unless they are very strong, blow through the Strait,—if not, a ship is drifted over to the eastern shores, where, from the force of the tides, she must be quite unmanageable."

Captain Fitzroy, whose authority, from his experience, must be very good, seems to think there is neither difficulty nor risk in passing the Strait. The only danger that does exist, and that may be an imaginary one, is the failure of the wind. Ships passing through it from the south are not so liable to the failure of the south-westerly wind, unless it be light, and then it will probably be from the N. W. at the northern end of the Strait. The anchorage in Good Success bay, however, is admirably situated should the wind or tide fail.

In passing to leeward of Staten island the tide race, which extends for some distance off Cape St. John, at the N. E. end of the island, must be avoided, otherwise there exist no dangers.

The anchorage under New Year's islands, although it is a wild one and the bottom bad, and the tide very strong, yet offers good shelter from S. W. winds, and might be occupied with advantage during the existence of a gale from that quarter,—since it is unfavourable for ships bound round the Horn.

After passing Staten island, if the wind be westerly, the ship should be kept upon the starboard tack, unless it veers to the southward of S. S. W., until she reaches the latitude of 60° S., and then upon that tack upon which most westing may be made. In this parallel, however, the wind is thought to prevail more from the eastward than from any other quarter. Never having passed round Cape Horn in the summer season, I may not perhaps be justified in opposing my opinion to that of others, who, having tried both seasons, give the preference to the summer months. The advantage of long days is certainly very great, but, from my experience of the winds and weather during these opposite seasons, at Port Famine, I preferred the winter passage; and, in our subsequent experience of it, I found no reason to alter my opinon. Easterly and northerly winds prevail in the winter, off the cape, whilst southerly and westerly winds are constant during the summer months; and not only are the winds more favourable in the winter, but they are moderate in comparison to the fury of summer gales.

Having passed the meridian of Cape Pillar, it will yet be advisable to take every opportunity of making westing, in preference to northing, until reaching the meridian of 82° or 84°, which will enable a ship to steer through the north-westerly winds that prevail between the parallels of 50° and 54°.

SECTION X.

TRACKS ACROSS THE ATLANTIC.

ENGLAND TO BRAZIL. Vessels leaving the English channel are recommended to shape their course so as to pass well to the westward of Cape Finisterre (latitude 42° 54′, longitude 9° 17′) at from 30 to 50 leagues. Passing the Coast of Portugal steer for the Madeira islands, and endeavour to make Porto Santo, which lies in latitude 33° 3′, longitude 16° 18′, as by getting sight of this island you will proceed on your voyage with greater certainty. In the Bay of Biscay, and to the westward of Ushant, the current sets to the westward, at times, in winter, but in summer it generally sets N. E. and Easterly. It is often found to set eastward from March to November, particularly when westerly winds prevail; and off Cape Finisterre, and near the south part of the bay, it sets mostly along the coast to the eastward; and, along the east side of the bay, it sets to the northward, parallel to the west Coast of France. Caution is therefore requisite, with a westerly wind, in standing to the southward to weather Cape Finisterre; for, should a ship's position not be ascertained by chronometers or lunar observations, it would be imprudent, in gloomy blowing weather, to stand to the southward in the night, if not certain of being well to the westward of the cape.

Sometimes gales of wind from W. N. W. blow into the Bay of Biscay, continuing for several days; and some of the outward-bound East India ships have been driven far into the bay during these gales, in April and May. If a ship have the misfortune to lose any of her masts, during one of these gales, the heavy sea rolling in from N. W. and W. N. W., with an easterly current, would unavoidably force her to leeward, and, should the gale continue long and severe, she might be in danger of drifting on a lee-shore.

During the winter months, those who are not desirous of stopping in Funchal road should pass to the westward of Madeira, at any convenient distance, not less than 6 or 7 leagues, as strong westerly gales prevail in November, December, and January, which produce severe squalls and eddy winds, near the island on the east side.

Having sailed to the westward of Madeira, it is advisable to pass to the westward of the Canary and Cape Verd islands, keeping at any discretional distance, or barely in sight of them. By this course you will not only avoid the light winds and calms which frequently prevail among these islands, as well as several dangers in their vicinity, but may reasonably expect a steadier breeze; although there are instances of ships, after passing in sight of the Canaries, to the westward, having the wind from that quarter, which obliged them to pass to the eastward of the Cape Verd islands.

Leaving the Canary and Cape Verd islands steer on southerly, and endeavour to cross the Equator, between the meridians of 18° and 23° W., but by no means further to the westward, lest the westerly current, which sweeps round Cape St. Roque, lead you into danger.

In approaching the Coast of Brazil, considerable attention should be paid to the season of the year; periodical winds prevailing from S. S. E. and S. E., from March to September, the current then running northerly; but between September and March the wind blows from the N. E. to E. N. E., and it then sets to the southward. It is, in consequence, advisable to make the land to windward of the port bound for, and according to these periodical winds, which commonly govern the current when the sun is in the northern hemisphere; the winds on this coast will incline more from the south-eastward, than in the opposite season (when the sun is to the southward of the Equator) for then they prevail to the eastward.

It also appears that, in any season of the year, if the coast be not made to the northward of Cape St. Augustine, there will be no difficulty in getting on to the southward; for ships which made the land in latitude 7° or 8°, even in the unfavourable season, by making a few tacks, always readily proceeded to the southward, and experienced little or no northerly current; nevertheless, in a bad sailing ship, it would be highly imprudent to make it to the northward of Cape St. Augustine, especially between the months of March and October; and certainly it should never be made to the northward of Cape Ledo, or near Cape St. Roque, on account of the S. E. winds and W. N. W. currents, before-mentioned, which might fatally sweep you round to the northward of the Cape.

Every navigator should, therefore, be attentive to the time of year he makes the Coast of Brazil, there being a kind of monsoon, or trade-wind, blowing from the N. E. and E. N. E., with a current setting south, from the month of September to March; while from March to August, the winds are from the S. E., E. S. E., and S. S. E., the current then setting north; according, therefore, to the seasons, he should run into a higher or lower latitude than the port he is bound to.

From Cape St. Roque to Cape St. Augustine the land may be approached by soundings of moderate depth, and gradually lessening as you approach the shore.

A strong southerly current commences from Cape St. Augustine, about the middle of October and continues until January; no particular current succeeds till the month of April, when, generally about the middle of that month, a strong one sets in northerly until July, when it again subsides until October; near the shore the wind, for nine months in the year, generally blows north-easterly in the morning, and north-westerly during the night, continuing gradually to change along the coast, until, at Rio Janeiro and the River Plate, it becomes a regular land-breeze from evening to morning, and throughout the day the reverse. From the end of February till the month of May the wind is mostly from the south, blowing strong and stormy, with frequent squalls from the S. W.

COAST OF BRAZIL TO THE CAPE OF GOOD HOPE. The directions given for this route by Captain Horsburgh, are as follows:—"During most months of the year the south-east trade fails about the southern tropic, or 2° or 3° beyond it, when the wind is found to veer from eastward to north-east, and northward; the northerly winds prevail more than any other in the vicinity of the south-east trade, and as far as latitude 34° or 35° S., from the Coast of Brazil to the meridian of London, or a little further eastward. When therefore a ship departs from the Brazil coast, or has got to the southward of the south-east trade, she will most probably, in almost every month of the year, meet with brisk winds veering from N. E. to N. W., and sometimes to W. and W. S. W., which will carry her quickly to the eastward. These variable winds keep mostly between north-east and north, attended with smooth water and fine weather.

When cloudy weather accompanies these northerly or north-east winds there is a risk of a sudden shift to the south-west or south.

A ship by running to the eastward, in the track of these winds, gradually increasing the latitude as she proceeds, will often make greater progress than by going to 38° or 39° S. in search of westerly winds. Although here the westerly winds prevail during most months of the year, they are often very unsettled, completing a revolution round the horizon, coincident with the course of the sun every two, three, or four days, with intervening calms, particularly when the wind is from the south-west quarter. It seems, therefore, inexpedient to increase the latitude more than 35° S., till a ship has reached the meridian of London; she may then gradually proceed into 36° or 37° S., as she approaches the Cape, for the southerly winds which prevail around the cape-land from January to April (and at times in other months) extend far to the westward.

In February and March these southerly winds are frequently experienced between the Cape and the meridian of London, on which account it is prudent for a ship bound to it in this season, to increase her latitude to 35° or 35° 30′ S., when she draws into east longitude. She ought then to keep in about 35° 30′ S., if possible, till the Cape is nearly approached, to prevent being driven to northward of Table bay by the southerly winds.

From December to April, *if it is not intended to touch at the Cape*, a ship should get into latitude 37° or 38° S., about the meridian of London, and and keep in 37° and 39° S. in running down her easting; for the winds will be found as variable for this purpose in 38° or 39° S., or probably more so, than if she were in a higher latitude. In passing the bank of Cape Aguilhas, the stream of current setting westward ought to be avoided by keeping at least in latitude 37° S.; and she should not go to the northward of this parallel in running down her easting, after passing the Cape, or she may be greatly retarded by the south-easterly winds which prevail in these months, to the northward of latitude 35° or 36° S.

ROUTE HOMEWARDS. CAPE OF GOOD HOPE TO ST. HELENA. Having rounded the Cape of Good Hope, a direct course for St. Helena is about N. N. W. to N. N. W. ½ W., 566 leagues; it is however advisable to steer about N. W. by N. until a considerable distance is gained from the western Coast of Africa, because you are liable to encounter N. W. and W. N. W. squalls at times, particularly when near the coast; it is true they do not often happen, but they have sometimes been experienced in both seasons. A direct course about N. N. W. ¼ W. or N. N. W. will then be fair for St. Helena.

If the wind be strong, veering to the E. S. E., allowance for a leeward current should be made, particularly should the weather happen to be cloudy and the longitude uncertain. In such case it will be prudent to make the latitude of the island several leagues to the eastward of it; and haul round the N. E. or Sugar-loaf point for the anchorage, as described in the particular directions for St. Helena, in a subsequent portion of this work.

ST. HELENA TO THE EQUATOR, AND THENCE HOMEWARDS. Leaving St. Helena, a direct course N. W. by N. may be steered for Ascension island, and in this part of the passage a steady S. E. trade generally prevails all the year, with westerly current at times. Ascension may be passed on either side at any convenient distance, but it is usual to pass to the westward of it, at from 3 or 4 to 10 or 12 leagues distance. Proceeding from Ascension towards the Equator, steer N. N. W. or N. by W. ½ W., and endeavour to cross it between the meridian of 18° and 25° W., taking care you do not get to the eastward of the former, nor westward of the latter. Should the sun be in the northern hemisphere, cross it, if possible, between 21° and 23°, as variable light winds extend a great way out from the coast of Africa in July, August, and September, whilst the sun is returning from the tropic of Cancer to the Equator.

To sail from the Equator to the northward, a N. or N. by W. course may be steered, if the southerly winds become light, in order to reach the N. E. trade as soon as possible; but if variable light breezes are found to continue far to the northward of the Equator, a berth of 40 or 50 leagues at least ought to be given to the Cape Verd islands. In crossing the N. E. trade a ship's sails should be kept well filled to enable her to gain speedily to the northward. In this route the Sargasso sea, hereafter more fully noticed, is usually first seen about the parallel of 24° or 25° N., extending sometimes as far to the northward as 40° or 41° N. When ships get to the northward of the northern limit of the trade-wind in latitude 30° or 32° N. their longitude will be generally from 39° to 42° W.

Should the wind veer to the N. W. on approaching the Azores, you may pass through one of the channels of this islands, and thence pursue a course for the English channel according to circumstances. It is seldom advisable to pass to the eastward of the Azores, because northerly winds, which often prevail between them and the Portuguese coast, are unfavourable for pursuing a direct course towards the channel; it is, therefore recommended to pass round to the westward, though it has sometimes happened that vessels sailing to the eastward of the Azores have met with S. W. and W. winds, and reached the channel sooner than others, which went round to the westward of those islands.

SAILING UP THE ENGLISH CHANNEL.

In all previous instructions for entering the British Channel, it has been directed for ships to get into the parallel of 49° 25′ to 49° 30′; but this, as Captain Horsburgh very justly remarks, seems intended for ships navigating by dead reckoning, and even in that respect are improper; because ships endeavouring to get into that parallel from the southward, would be under the necessity of making a more circuitous route, than would be requisite, in steering a direct course for the Lizard point; and as S. W. or westerly winds are prevalent for the most part of the year, there is no necessity to steer so far to the northward, which, in war time, would be very likely to run the risk of being captured, added to which is the very probable danger of meeting with a sudden shift of wind, when nearing the Scilly islands, and thereby get driven into the St. George's Channel; these and many other reasons of equal weight that could be adduced, is sufficient to prove the error of following such directions. What Captain Horsburgh advises (and his long experience, ability, and elevated station, eminently qualify him to give the best directions) is to shape a direct course, after passing the Azores, towards the Lizard point, inclining a little to the northward, or otherwise as circumstances or winds may render most advisable. It is highly necessary here to offer some remarks on the current, which occasionally sets athwart the entrance of the English Channel to the N. W. and W. N. W. from the Bay of Biscay, and which, from not being noticed, has often been productive of very serious mischief. It is a temporary stream, and not perceptible, unless there has been a continuation of westerly and south-westerly winds; this forces an unusual quantity of water into the bay, which makes its escape by setting to the N. W. or W. N. W., at some distance to the westward of the isles of Ushant and Scilly; it may be presumed that the stream generally goes off to the N. W. about the parallel of 51°, between longitude 14° and 15°, and of course the velocity will be proportionate with the direction and strength of the wind.

As a general remark, it may be observed, that the current sets to the westward, at times in the winter, but in summer generally to the N. E. and easterly. The middle of the stream always preserves its original course, which is about N. W. by W. much longer than the edges, whose course is on the eastern side more north, and the western side more west; for which reason the northern current has more force near to the west of Scilly, than further to the westward; and therefore it is evident that ships which cross the current in an oblique direction, steering a true E. by S. course, or more southerly, or with light winds, will be more affected by it than those which steer more directly across it. On approaching the channel in the night time, if there should have been a continuance of westerly winds, it would be dangerous to run eastward, notwithstanding a good observation of latitude may have been made, for in that case a ship might be drifted by the current, from what would be considered a safe parallel to the parallel of the Scilly rocks; in order to avoid any danger, it is best to keep at the highest in 48° 45′; because the whole effect of the current in the worst situation, may be felt if you should get into the parallel of 49° 30′; whereas from the current in 48° 45′, a wind from the southward will set the ship into the Channel.

Near the entrance of the Channel N. E. and northerly winds generally prevail from January to May, and from May to December, S. W. and westerly winds are mostly experienced; sometimes southerly and N. W. winds prevail, but they are seldom of any long continuance, and generally veer to the westward, although sometimes they veer to north and north-eastward. Therefore from January to May, when N. E. or northerly winds are prevalent, it will be best to get into about 49°, when approaching the meridian of Cape Clear, from whence an easterly course ought to be followed for the Lizard, and if the wind should blow steady from the northward, the parallel of 49° 30′ may be preserved in passing the Scilly islands. If from April or May to about December, when S. W. and westerly winds mostly prevail, you should get into the latitude of 48°, when you reach the meridian of Cape Clear, and from this situation a direct course may be steered for the Lizard point.

The Ushant lights are in latitude 48° 28′ North, and generally supposed longitude 5° 3½′; but Captain Heywood, who is acknowledged to be a very clever and intelligent officer, made them in longitude 5° 13¼′ or 1° 44¼′ West from Torbay anchorage, by good chronometers. Near Ushant the soundings are about 54 fathoms. High water half-past 4, and the variation 25¼ W.

The St. Agnes light, Scilly islands, is in latitude 49° 53′ 37″, longitude 6° 19′ 23′ West; it is a revolving light, and obscured for a time in each revolution.

The allowance for variation on entering the British Channel, may be about 26° West, until near the Scilly islands; 25° in running up to the Isle of Wight, and 24° from thence to Dungeness. In steering up Channel, however, with the ship's head easterly, the west variation will very likely be from 1° to 4° less than the true variation, and the same access of west variation will probably be experienced if the ship's head be to the westward.

It is an opinion of Captain Flinders, founded on experiment, that the magnetism of the earth, and the attraction of the iron in a ship, acts as a compound force, in producing the error of variation, by the change of a of a ship's head, and as the error at any direction of the ship's head will be to the error when her head is east or west, at the same dip of the needle, as the sine of the angle between the ship's head and magnetic meridian is to the sine of 8 points or radius.

Strong south-westerly winds force an accumulation of water into the British channel, and the tides are then much higher than at any other time; the velocity of the flood is also increased by these winds, and continues an hour or more longer than usual, the ebb being greatly repressed by them; from which it happens that ships running up channel with a strong S. W. gale, are liable to be ahead of their reckoning, unless a proper allowance is made; for by entering into the first of the flood, and running at the rate of 8 or 10 knots by the log, they will carry the tide with them 10 or 11 hours, which may carry them all the way from the start up to Beachy head, or even to Dungeness.

If uncertain of your latitude on steering into the channel, you ought to keep well to the southward of the Scilly islands on passing them; and in the night, or foggy weather, not to shoalen your water less than 60 or 62 fathoms; you will have 70 fathoms yellow or white sand abreast of them to the southward in latitude 49° 20′. The light on St. Agnes may be seen at a considerable distance, but there are many dangerous rocks stretching from it for about 5 miles to the W. S. Westward, having very irregular soundings of from 40 to 50 fathoms, about 1 or 2 miles S. W. from them, and a rocky spot with overfalls, shoaling in from 50 to 16 fathoms, about 5 miles S. S. W. from them.

If you should happen to get into latitude 49° 25′, and running for the channel, and have run so far to the eastward as to shoalen your water to 66, to 65, or 67 fathoms, and the soundings are shells and small yellow stones, or red stones or red sand, you may thence conclude that you are abreast of Scilly; or if you have 68 fathoms, white sand with gray specks, and sometimes shells and stones, Scilly will then bear about N. E. from you, distance 10 leagues. Your soundings will always inform you whether you are to the northward or southward of Scilly. In the latitude and to the northward of Scilly you will find it so oozy and muddy, upon the edge of the ground, that it will very frequently be washed off the lead. The soundings near Scilly are very different from all others in this latitude; pieces of rotten rock as broad as a small bean, and of a stone colour, will come up with the lead, which will not be the case anywhere else in the same parallel. More to the southward you will have deeper water, with fine sand, interspersed with black specks like ground pepper. Abreast of Scilly, in the latitude of 49° 20′, you will have 70 fathoms, branny or yellow and white sand; and, to the eastward of Scilly, in the latitude of 49° 8′, you will have 56 or 58 fathoms, coarse sand. You should then steer more to the northward, and endeavour to make the land about the Lizard; you may safely make it in the night as well as in the day, if the weather be clear, for the lighthouses stand so high, and the coast is so clear, that you may, without danger, come within half a mile of the point. If the weather prove so thick that you cannot safely make the land, come no nearer to the Lizard than 45 fathoms, for, in that depth, you will not be more than three leagues off the point; your soundings there will be pebble stones and scallop shells.

The southern point of Little Sole Banks lies at the distance of about 50 leagues to the westward of Ushant, in the latitude 48° 22′, longitude 8° 50′. They stretch from thence about 11 leagues to the N. N. W., and are about 4 leagues in breadth, having a depth of from 60 to 80 fathoms, fine sand. Ushant should not be approached, in foggy weather, nearer than 64 fathoms, as there is a depth of 60 fathoms about 3 leagues from the island. You will have 70 fathoms about 8 leagues west from Ushant; and at 26 leagues distant, in the same latitude as Ushant, 85 fathoms, and 12 leagues further there are 74 fathoms. The ground is of various descriptions, but generally gray or brownish sand, with broken shells. The Great Sole Banks are about 5 leagues broad, and the body of them lies in latitude 49°, longitude 10°, with 60 to 70 fathoms; on either side there are 90 fathoms, fine sand. It is possible, while running along this parallel, you may shoalen your water to about 6 fathoms, and, after deepening to the former depth, find shoal water again, after running 3 or 4 leagues; but you may be certain of having the channel open when you get in from 90 or 65 fathoms, fine sand and black specks, and with this ground you may approach to within the distance of 14 leagues to the S. W. of Scilly. When you are to the southward of the fair-way, it has generally been observed that the ground is reddish, coarse, and rather stoney, and the sea has a peculiar appearance towards the French coast, from the tide whirling round in many places; but when in the fair-way, and the channel open, you will have fine light coloured and gray sand, with a depth of from 100 to 80 fathoms; and in 75 and 70 fathoms, brown sand and black specks. After passing the Scilly islands you must steer rather more northerly to make the Lizard, if the wind is favourable; but in thick foggy weather, or with scant southerly winds, you ought not to approach that point in less than 45 fathoms; you may then be about 3 leagues off. Close in with the Stag's rocks, that lie off the front of the point, there are from 10 to 12 fathoms. As the soundings are from 30 to 40 fathoms, about 2 miles from the point, there will be no danger in approaching within that distance in the day time, and in fine weather in the night. When the two lights are conspicuous they may be made with safety. The advantage of making land about the Lizard is, that you may know how to steer in advancing upwards, if thick weather should come on, and if this land cannot be distinguished, you must endeavour to get a sight of the Eddystone, or the land over the Start point, which is a sloping oblong hill. By not attending to this mode many ships have got over on the French coast, and have been lost; for there is a strong indraught of the tide between the Coast of France and the Islands of Guernsey and Jersey, which has often proved fatal to ships steering up channel, that have not kept within a proper distance of the English Coast.

Off the Lizard point the stream of flood runs to the eastward, in mid-channel, until nearly eight hours, at full and change of the moon, and it is then about half ebb on the shore.

The course and distance from the Lizard to the Start are E. by S. Southerly, about 21 leagues; and between the Lizard and Eddystone a ship may stand off to 50, and inshore to 42 fathoms, but not nearer, by reason of there being 36 fathoms in the stream of the Eddystone; but between the Eddystone and the Start you may approach the shore to 32 fathoms, and stand off to 46 fathoms.

The Hand-deeps bear from the Eddystone N. N. W. $\frac{1}{4}$ W., 3 miles; and the East Ruts E. by S. $\frac{1}{4}$ S., 11 miles.

From the Start to the Bill of Portland the course and distance are E. $\frac{1}{2}$ S., 16 leagues; but, from the Start, a course must be pursued as circumstances render most advisable, borrowing towards the English Coast, with northerly winds, or keeping near mid-channel, with S. and S. W. winds; and, should you have passed the Start, at the distance of about 4 leagues, it will be proper, with a fair wind, to steer an E. by S. course, which will, in general, carry a ship direct up until abreast of Beachy

Head,* which a large ship ought not to approach nearer than 18 fathoms, on account of the shoals that lie to the S. E. and Eastward of it. After clearing these you must haul up E. and E. N. E. for Dungeness, by which the Ridge and Varne will be avoided in proceeding towards the South Foreland.

As the weather in the channel is frequently thick and foggy, too much caution cannot be used, particularly with variable winds; you may keep in from 30 to 36 fathoms between the Start and the Bill of Portland, and, by not exceeding this depth, you will avoid the strong indraught, before noticed, between Guernsey, Jersey, and the French Coast, and their contiguous dangers. The flood of the Bill of Portland runs to the eastward, until a quarter past 10, at full and change. Care must be taken not to approach the Race and Shambles in less than 26 fathoms, for the water suddenly deepens to 40 fathoms, and more in some holes near the Race, with a rocky bottom, very uneven. In thick weather the lead ought to be kept going, particularly in approaching the Isle of Wight, for many ships have been lost by omitting it. Between the Bill of Portland and Dunnose, 35 to 26 fathoms are proper depths to keep in, with a N. W. or Northerly wind, and by not getting into less than 26 fathoms the indraught towards the Needles, &c., will be avoided. The flood runs to the eastward of Dunnose, in mid-channel, until about eleven hours, full and change, and two hours earlier on the shore it is high water.

Off the south part of the Isle of Wight the ground is rocky and uneven, with strong riplings during spring tides, and therefore a good offing should be kept.

From Dunnose to the Owers the shore may be approached to within 20 or 22 fathoms, and you may stand off to 30 fathoms: if it should be thick weather, and light winds, when near the Owers, the lead ought to be used, because the last quarter flood, and the whole of the ebb, sets strong over the Owers bank towards St. Helen's road, and there are 20 fathoms very near it. Eastward of the Owers lies the Kingsmore shoal, extending N. E. and S. W. about 2 miles, having about 6 fathoms, hard gravel, on its S. E. point, which is the least water.

The depths proper to preserve between the Owers and Beachy head are from 20 to 18 fathoms, and, by not borrowing under 18 fathoms, you will pass outside the Royal Sovereign shoals, the outermost of which is called the Wide-mouth shoal, being of a circular form, about 500 feet in diameter, with 12 or 13 feet on it at low water, spring tides. To avoid it, when round Beachy head, look out for a spot called Greenland, which keep open with the Bluff head, and steer E. by N., by compass: by this you will fetch Dungeness lighthouse. Another patch, with 4 fathoms on it, is reported to be E. S. E. ¾ S., 6½ miles from Beachy head, and about 1 mile outside of the former. The Horse of Willingdon lies within them. Off Beachy head the flood runs to the eastward, until three-quarters past 11. There is much safer anchorage in hard blue clay, and better riding here than at Dungeness; the mark is to bring either of the three windmills on with the sea houses, at East Bourne. From the shoals off Beachy head to

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* A LIGHTHOUSE is now erected on *Beachy Head*, which exhibits a *revolving light* every night from sunset to sunrise. The light burns at an elevation of about 285 feet above the level of the sea, on a spot called *Belle Toute*, being the summit of the second cliff to the westward of Beachy Head, and exhibits its greatest brilliancy once in two minutes. Ships sailing from the eastward open the light when bearing N.W. ¾ W. Westerly; and, whether going up or down channel, when to the eastward of Beachy Head, and within 3 leagues of it, by keeping the light open, will pass to the southward of the Southern Head, and all other shoals in its vicinity.

Dungeness you may stand in to 12 fathoms, and off to 20; and by not coming under 12 fathoms, you will pass clear outside the shoals which lie to the east and west of Dungeness: here the meeting of the tides takes place. From Dungeness a ship should not stand further off than 17 or 18 fathoms, on account of the Varne, nor less than 12 fathoms towards the shore, until clear of the ledge of rocks that project above a mile from the shore, to the westward of Folkstone. After getting to the eastward of this ledge you may safely approach to within 10 fathoms; and, by keeping within three miles of the shore, in passing from Folkstone to Dover, the Varne and Ridge will be avoided. From Dover road towards the Downs 17 fathoms will carry a ship outside of the South Sand Head, while the track of 15 fathoms will lead directly on it, and 12 or 13 will carry within it; but, in consequence of the South Foreland being steep-to, many ships in the night have run upon the shore, in thick foggy weather, for fear of getting near the Goodwin. However, if the South Foreland lights are seen, by keeping them in sight, from the deck, over the land, there need be no fear of getting upon the main; but you ought not to come under 10 or 11 fathoms, off the pitch of the Foreland, because you will only be about half a mile from the shore, which is steep, in from 10 to 6 fathoms, and in these depths a ship might ground on the rocks, before another cast of the lead could be got.

If the weather should be so thick as to prevent the lights being seen, it is certainly most advisable to borrow near the main, rather than venture near the Goodwin; but, as the soundings are not a sure guide, great caution must be used, for you will find the depths to decrease towards the South Sand Head, as well as towards the main. The best plan is to keep along the shore, in about 12 fathoms, under easy sail, so as to enable you to get exact soundings; and, when round the pitch of the Foreland, it will be advisable to haul up well to the northward, until a cast of 9 or 8 fathoms is got, so that you may be certain the decrease of depth is towards the main; but, in doing this, you must heave the lead quick, and not borrow under 8 fathoms towards the shore, until you anchor in the Downs.

TO THE SENEGAL AND BACK.*

OUTWARDS. Whatever may be the season of the year at which vessels sail for the Senegal, it is advisable to get twenty-five leagues to the westward of Cape Finisterre; from hence it is immaterial whether a course be shaped to the eastward or westward of Madeira. A vessel desirous of touching at the Canaries will adopt the former, and will shape a course for Teneriffe, having nothing to apprehend but the Salvages, the position of which has been frequently well determined. There is no danger, under water, yet known of in the Archipelago of the Canaries; the winds are mostly from N. to N. E., and vessels are seldom becalmed amongst these islands so much as to retard them in their voyage materially. If the course to the westward of Madeira be adopted, a vessel will only make the westernmost of the Canaries, and her place may be rectified by Palma or Ferro.

The information which has been before given in this work, on the Coast of Africa, explains every thing which these points possess, of a nature interesting to the navigator; and by means thereof a vessel may steer for any particular point of the coast.

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* Taken from the observations of Baron Roussin. The courses are corrected by the Magnetic Variation, and consequently reckoned from the true North.

A sight of the Coast of Africa, however, is by no means necessary for vessels bound to the Senegal or Goree. What has been said of the currents and prevailing winds in this navigation, leaves no doubt that it is perfectly useless to make the land more than fifteen or twenty leagues to the northward of the Senegal, when bound to the bar anchorage. This digression is the utmost which should be made from the above course, and by means of the lead, and some few latitudes carefully observed, it might even be made a direct one. On leaving Teneriffe, the true course should be S. by W. ½ W., as far as the parallel of 21°, then South as far as 20°, and from thence steer S. E. by S., without any further alteration.

The first course will carry a vessel more than twenty-five leagues from the nearest point on the African Coast, and in a track where no danger has hitherto been found. The second will conduct her twenty-six leagues to the westward of the westernmost point of the bank of Arguin. By the third she will make the coast in the neighbourhood of the Marigot of the Musquitoes; from whence she may coast the shore until abreast of the Senegal.

If it be found necessary to make the land during the night, the lead being the only means of correcting the estimated run, should be used more frequently and with greater care. At about ten leagues from the shore to the northward of the Senegal, a bottom of white sand will be found with seventy fathoms. From thence the depth gradually decreases towards the shore, and at one mile from it there are seven or eight fathoms. When in fifteen fathoms water, it is advisable to anchor until daylight, to avoid running past the bar, which has no mark for indicating it during the night.

If a vessel should make a point on the African Coast, to the northward of the bank of Arguin, for instance, Cape Blanco, and starting at three leagues therefrom, by steering true S. W. by S., and sounding until on the parallel of 20°, which is a little to the southward of the western point of the bank of Arguin, she will then be about twelve leagues outside of this bank, and in soundings from eighty to one hundred fathoms, fine sandy bottom. But I must repeat, that in voyages to the Senegal, a sight of the land to the northward of the Marigot is absolutely useless. In the navigation of the African Coast, there is a source of error attached to it, which should be carefully guarded against. It is the optical illusion caused by the great horizontal refraction, which renders any correct estimation of distance almost impossible. Numerous instances of it might be cited, which would hardly be credited, therefore the moment the coast is seen, the lead only should be trusted, to determine the distance from it.

SENEGAL TO GOREE. The Almadies are thirty-one leagues S. 40° W., from the Roadstead of the Senegal, and the prevailing currents set nearly on that bearing; it is therefore the course to be steered from the Senegal to Cape Verd during the day. During the night a vessel should steer a quarter of a point more to the westward. From Cape Verd to Goree the course is direct. A vessel is merely required to coast the shore at a distance of two miles.

HOMEWARDS. The voyage from the Senegal presents no difficulty, and calls for no other precautions than those commonly used by all navigators in long voyages, on seas void of dangers. These precautions are, not to trifle with the wind, but rather to make a good run in a given time, than to endeavour to make good the proposed course. In all return voyages from places within the Tropics, the grand point is to leave the region of the trade-winds, and get into the variables, and the currents setting to the eastward, as soon as possible. As the winds generally blow from E. to N. W. on the Coast of Africa, from the month of December to the end of June, a vessel should keep on the starboard tack until out of their influence. The course made good will be about N. W. and she will then be in the neighbourhood of the Azores. It is immaterial whether she passes to the northward or through the channels of these islands, but it is remarked that the winds are stronger to the westward. It is seldom possible to pass to the eastward of them. The distance no doubt would be shortened, but this passage can only be effected by keeping close to the wind thus far, and experience has proved that there is little to be gained from that. Between June and October, after the squalls from the S. E., the wind occasionally veers round to the West, on the coast near the Senegal; and sometimes it is possible to get within sight of Cape Mirik by means of this wind, and by keeping along shore on the larboard tack.

TO AND FROM THE WEST INDIES.

VESSELS bound to the West Indies, or southern parts of the United States of America, are directed to pursue their course to the westward of Cape Finisterre, agreeable to the instructions already given; passing Madeira the best course is S. S. W. to gain the trade-winds as quickly as possible, and afterwards proceed to the westward towards your port of destination. SHIPS BOUND TO JAMAICA commonly sail between Montserrat and Guadaloupe and proceed for the high peaked rock, called Alto Vela, 5 leagues from Beata point, the most southern extremity of St. Domingo; in sailing hence to Jamaica be cautious of running too far north, lest you get on Morant point (the easternmost point of Jamaica) which is extremely low. In thick hazy weather it may possibly be approached so near as to make it difficult to weather, the wind setting right on and the current always going to leeward. Keep therefore, if possible, in about the parallel of 17¾° N., and you will run without danger for Yallah's point (see our new chart of Jamaica) where pilots may be obtained for Port Royal.

LEAVING JAMAICA in the months of October and March, while north winds prevail in the Gulf of Florida, the general route for vessels bound to Europe is through the *windward channel*, but at other periods the speediest passage is considered through the *Channel of Yucantan*, and having the *Gulf Stream* in your favour, sail through the *Strait of Florida*. Having cleared the strait, the best track, in summer, is to the northward of the Bermudas within the influence of the stream, crossing the tail of the Banks of Newfoundland, and so proceed for the English channel to the northward of the Azores. In winter, when north-westerly gales may be expected from the coasts of America, it is better to pass to the southward of the Bermudas, in about the parallel of 30° N., until you get to the eastward of them, when you may gradually increase your latitude to 35° or 36°, but not higher, until you reach within a few degrees of the Azores.

TO NORTH AMERICA, NOVA SCOTIA, NEWFOUNDLAND, &c.

VESSELS BOUND TO THE UNITED STATES, &c., should keep a north-westerly course, until they gain considerably to the westward; by this route the winds will be more favourable than in a more southerly latitude, and ultimately wind and current will prove to your advantage. We would therefore recommend, during the spring of the year, to keep in about the parallel of 46° or 47°, until you reach the meridian of about 37° W.; you may then gradually incline to the southward as far as 43° N., in which parallel you should endeavour to keep, until you reach Cape Sable, passing to the southward of Sable island at the distance of 60 miles. In the autumn or fall of the year vessels should get as far north as 50° or 55°, and having reached the longitude of 30° W. edge to the southward, and proceed as already directed.

SHIPS BOUND TO THE GULF OF ST. LAURENCE. Endeavour to strike soundings on the Great Bank of Newfoundland, about the latitude of 46° and between the longitudes of 49° and 52° W.; when having passed the meridian of Cape Race and reached the longitude of 53° W., a N. W. by W. course will carry them clear of St. Peter's island, and directly to the North cape of the Island of Breton. The North cape and Cape Ray, the south-west point of Newfoundland, form the two points of entrance to the Gulf of St. Laurence; they lie E. N. E. $\frac{1}{4}$ E. and W. S. W. $\frac{1}{4}$ W., distant 18$\frac{1}{2}$ leagues from each other. Between them and about 4 leagues E. N. E. $\frac{1}{2}$ E. from Cape North, is the little island of St. Paul, appearing with three hills upon it and deep water all round; but about 11 or 12 miles N. N. Westward from the island is a fishing bank of 25 and 30 fathoms water, while at nearly the same distance from the island, in a N. N. E. direction, are 140 and further east 186 fathoms. Cape Ray bears from St. Paul's island E. S. E. $\frac{1}{2}$ E., distant 14 leagues.

After passing the islands of Miquelon and St. Peter's, endeavour to steer a middle course between Newfoundland and Breton, passing on either side of St. Paul's island, but by no means run beyond the parallel of 47° 33′ N. until well passed Cape Ray, for the harbours on the south coast of Newfoundland, to the west of Fortune island, are full of dangers, and but imperfectly known; while the whole shore is frequently enveloped in thick fogs, and the rocks cannot then be perceived before your vessel has got irrecoverably entangled among them. In this part also shifts of wind are common, and it will often happen that after blowing a gale from one point of the compass it will suddenly vary to the opposite point and continue equally strong: thus it has been known that while one vessel has been lying-to with a heavy gale, another, not more than 30 leagues distant, has been in another gale equally heavy, but with the wind in a direct contrary direction. The winds within the Gulf are not so liable to such sudden changes as on the outside, or to the eastward of Breton island.

St. Paul is not a dangerous island, and may easily be discovered even in foggy weather, by keeping a good look-out; its shores are high, and although fogs do frequently obscure the land, yet it will in general be seen in time to avoid danger. The *Magdalen islands* extend in an E. N. E. and W. S. W. direction. There are no harbours, and you must give their N. E. extremity a berth of two miles, on account of a reef which runs out from it; in approaching towards them you must avoid the *Pearls'* ledge, of only 15 feet water, which lies with the south-eastern extremity of Entry island, bearing S. W. by W. $\frac{1}{2}$ W., distant 5 miles.

The Bird Islands are small and not far asunder; they are moderately high, flat at top, and have a white appearance. The southern one is the largest, and from its eastern end a ridge of rocks runs out; in the passage between them there is also a rocky ledge. *Brion*, or *Cross island*, lies W. by N., distant 4 leagues from the Bird islands, and N. $\frac{3}{4}$ E. about 10$\frac{1}{2}$ miles from the N.E. end of the Magdalen islands, being 5 miles long and very narrow. The depth of water between the Bird islands and Brion is from 4 to

14 fathoms; the N. E. end is bold-to, and there is no danger in the channel; but off the S. W. end there is a ledge of rocks even with the water's edge; between Brion and Magdalen islands are 10, 11, and 12, fathoms.

It was formerly generally considered that beyond the Magdalen islands all was deep water, but it is now asserted that a bank lies to the northward, having soundings upon it. In sailing from the Magdalen and Bird islands, you will, after you have passed this bank, drop into deeper water, and lose your soundings until you get near to Cape Rosier.

Having entered the Gulf of St. Laurence you will seldom fail to see the Magdalen and Bird islands, as they must be passed in the route towards the river. It will be better, in thick weather particularly, to go either to the eastward and northward of these between them and Newfoundland, or to the southward and westward between them and Prince Edward's island; for, although in fine clear weather, there is a good and safe passage between the Bird and Magdalen islands, yet when it is dark and foggy the channel will not be so easily distinguished, and perhaps might be mistaken and attended with danger. The weather to the southward of the Magdalen, and between them and Prince Edward's island, is generally much clearer than to the northward, therefore the passage that way is to be preferred, particularly after the early part of the year, for then south-westerly winds are most prevalent; and, also if necessary, clear and good anchorage is to be had at the south-eastern part of the Magdalens in Pleasant bay, very near the shore: this is a safe place for vessels to ride in with westerly winds, and is more to be recommended than to hazard the beating about in the Gulf with a foul wind; the passage into it is safe, and runs in between Amherst and Entry islands.

Currents. Vessels navigating the coast of Breton island, and particularly those which having crossed the Great Bank, and are steering for the Gulf, should be particularly careful to make a proper allowance for a strong current, which commonly sets S. by W. and S. S. W., about 3 miles an hour, and sometimes 4, by which the unwary mariner will be greatly deceived; for while he is considering himself in a fairway for the entrance of the Gulf, he will be drifted upon the iron-bound shore, the attendant fogs in summer time concealing his dangers, until it becomes too late for him to avoid destruction. To persons who may unfortunately be driven too near this coast, it may be serviceable to be apprized that a settlement is formed at Asphee bay, and good anchorage is to be had behind the island, where boats can land, and water and provisions be obtained; while, for want of the knowledge of such an establishment, many have been obliged to endure both hunger and fatigue unrelieved.

To ST. JOHN'S, NEWFOUNDLAND. Vessels bound to St. John's should keep in the parallel of about 46° N., and having reached the outer edge of the Great Bank, and obtained soundings in the meridian of 48½° or 49° W., should steer N. westward for Cape Spear, which lies in latitude 47° 30′ 53′ N., longitude 52° 33′ 27″ W. Between the cape and St. John's are three bays; the first called Cape Bay, lies between the cape and Black Head; the second, Deadman's bay, between the head and Small Point; and the third, Freshwater bay, between Small point and Fort Amherst.

St. John's has a narrow entrance, but the harbour is excellent; its situation is readily known by the Blockhouse, built on Signal hill, at the north side, and Fort Amherst on its south head, or point of entrance. The channel from point to point is only 360 fathoms wide, but it gets wider just within the points than between them, decreasing again as you approach the Chain rock, for from the latter to the Pancake rock the distance is only 95 fathoms; both these rocks are above water and steep-to.

Care must be taken in approaching the harbour in a large vessel, to avoid the *Vestal Rock*, which lies about 50 fathoms off the southern or Fort Amherst point; over this rock are 25 feet water; the marks for it are Fort William or the Old Garrison just open of the south head, and the outer Wash Ball rock open to the eastward of the Cuckold's head; these latter rocks lie close to the northern point of the harbour, and are always above water, being steep-to, and therefore not dangerous. The course in is N. W. by W., the shores continuing bold until you get near to the Pancake, then give the south side a small berth, continue the same course or rather more inclined to the westward, keeping Fort Amherst flagstaff open to the northward of Frederick's battery flagstaff; you will by these means avoid the Prosser, a rock on the larboard side running off the end of another rock, formed like a saddle, with 18 feet water in the hollow, and only 5 feet on its outside; yet it is steep-to, having not less than 5 fathoms close to it: so soon as you are within, and have passed the Prosser rocks, you may steer up as you please, both shores being clear of dangers, and anchor in from 4 to 10 fathoms water, on a bottom of mud, and lying quite landlocked.

The winds from the S. W. to the southward, as far as N. E. by E. blow in; all other directions of the wind either baffle or blow out of the Narrows; with the latter winds you must warp in, for the convenience of doing which, rings are fixed in the rocks on each side; the anchorage within the Narrows has from 10 to 16 fathoms, and a little before you enter the Narrows there are 20 fathoms. The tides rise 6, 7, and 8 feet, but very irregular, being much influenced by the winds. The VARIATION is about 2 points W.

TO HALIFAX, NOVA SCOTIA. Vessels bound to Halifax should pay particular attention to their soundings, especially about the neighbourhood of Sable island, as the island is low and appears like a small sand hillock. In summer it is frequently enveloped with a fog, but you may discover your proximity to it, by the depth of water; dangerous bars project from its N. E. and N. W. ends, therefore, observe, that, except on these sides, you will have 2 fathoms at the distance of 2 cables' off, your depth increasing at a general rate of about 2 fathoms for every mile until you are more than 20 miles from it.

Making the land of Nova Scotia, about *Cape Sable*, you must be particularly careful to avoid *Seal Island Rocks*, and the *Brazil Rock*. To the westward of Great Seal island the soundings are very irregular for upwards of 20 miles, at which distance are 45 fathoms, gravel and stones. Indeed the soundings along Nova Scotia from Cape Canso to Cape Sable, partake of the same irregularity from 25 to 50 fathoms, therefore you should not come nearer to the land than 35 fathoms, unless you are well assured of the exact part you are in, for otherwise endeavouring to enter Halifax you may be driven into Mahone or Mecklenburgh bays, and be caught by S. E. winds. The weather is generally foggy 4 or 6 leagues off shore, both in spring and summer, but it becomes clearer as you get nearer the coast, and with the wind off the land it will be perfectly clear. Your approach and arrival into soundings may generally be known by the increasing coldness of the water.

As you approach the harbour of Halifax, you will perceive the coast about its environs, particularly to the southward, to be ragged and rocky, with patches of withered wood scattered about; but the land is rather low in general, and not visible 20 miles off; with the exception of Le Have and Aspotogon, which may be seen 9 leagues. The latter have a long level appearance, and when they bear N. distant 6 leagues, an E. N. E. course will carry you to Sambro lighthouse, which stands on Sambro island, and is rendered remarkable by being a high tower 210 feet high.

Having made the lighthouse and coming from the westward, at night with a westerly wind, the light being 7 or 8 miles off, steer E. N. E. or E. by N. until you have passed the *S. W ledges*, and the lighthouse bears N.; then run on N. E. or N. E. by N. until you bring it to bear N. W., and then steer N. N. E. or N. E. by N. till it bears W. N. W., and, as the wind may answer, haul up N. or N. by E. for Chebucto head, avoiding the Bell Rock, which lies S. by W. ½ W., distant three-quarters of a mile from that point.

Chebucto head is bold to within half a mile from the shore; run on north along the west shore for Sandwich point, which is also bold: you will thus pass the *Lichfield rock* on your larboard side, distinguished by a buoy placed on its eastern end. A mile to the northward of the Lichfield is Mar's rock marked by another buoy, and also left on the larboard. When abreast of Sandwich point get as near mid-channel as you can, for on the opposite side is the *Horse Shore*, a dangerous shelf which stretches out from Manger's beach, and, having passed it, edge over towards Mac Nab's island. Reid's rock is marked by a buoy, and lies mid-way between Mac Nab's island and Point Pleasant shoals, also distinguished by a buoy, rather more than half a mile further on the same side, and this with Reid's rock are to be left on the larboard hand. On the opposite, or starboard side, there is a red buoy, placed upon the spit which runs off Mac Nab's island; sail between the two latter buoys, and having passed the reef, steer directly north for George's island, which you may pass on either side, and run up for, and abreast of, the town of Halifax, when you will find anchorage in 9 and 10 fathoms, muddy ground, two cables' length east of the mooring buoys, near enough to throw your hawser on shore. Between Manger's beach and Point Pleasant shoal there is a middle ground, which is sometimes distinguished by a buoy, but it has not less than 5 fathoms.

HALIFAX HARBOUR is sufficiently large to accommodate any quantity of shipping in perfect safety; its direction lies nearly N. and S., about 16 miles in length, terminating in *Bedford basin*, which is an extensive sheet of water, containing 10 square miles of safe anchorage.

TO THE BAY OF FUNDY. If you are off Cape Sable with a westerly wind, and bound to the bay of Fundy, it is advisable to make for the coast somewhere about the Skuttock hills, or Tit Manan lighthouse, as you can with greater safety pass to the westward than to the eastward. Between Grand Manan and the main the passage is free from danger; vessels beating through generally stand from side to side, particularly during the fogs, the depth being from 12 to 70 fathoms, with a bold shore on each side, and the tide through, strong and regular. The *Wolves* may be passed on either side, having deep water close to them; but they afford no sheltered anchorage, except for small fishing vessels in summer time; they are from 60 to 100 feet high. With light winds, a lee tide, or thick weather, you may let go an anchor anywhere betweeen the Wolves and Beaver harbour, in good holding ground, with a depth of 20 and 25 fathoms.

ST. JOHN'S, NEW BRUNSWICK. Point Lepreau is bold-to, but dangerous in dark weather, as it projects so far out to seaward; but from thence to St. John's the course is free from danger.

The entrance to St. John's is distinguished by a lighthouse, which stands on Partridge island. Vessels making for the harbour, so soon as they can well discern the light, should make the signal for a pilot. If unable to reach the harbour that tide, endeavour to run in between Meagenes island

and the main, either on the north or south side of that island; in doing this you will nowhere have less than 4, 5, and 6 fathoms water, bottom of sand and mud. Here you will obtain the best anchorage by bringing the three hills in the country, to the N. E., in a line over Rocky point island, and the house on Meagenes island S. E. by S. Proceeding for the harbour, and having passed Meagenes island, edge inshore towards Rocky point, until you perceive Meagenes point in a line with, or over the N. W. corner of Meagenes island; then sailing in between Rocky point and Partridge island these marks on will lead in the deepest water over the bar, until you open Point Maspeck, to the northward of the low point of Partridge island, when, putting the helm starboard, you should edge over towards Thompson's point, until you get the red store, at the south end of St. John's, in a line over the beacon. Keep the latter mark on until you pass the beacon, at the distance of a ship's breadth, then haul up N. N. W. for the harbour, keeping the block-house, at the upper part of the harbour, open to the westward of the King's store, this will lead you in mid-channel to the wharfs, where you may lie aground, dry at half tide; or you may ride afloat in the stream, at single anchor, with a hawser fastened to a post on shore.

CHANNEL BETWEEN MANAN AND BRIER'S ISLANDS. Some caution will be necessary in steering between Grand Manan and Brier's islands in thick weather, as vessels are frequently drawn in among the islands and ledges to the southward of Manan, by the flood setting directly upon them; the most dangerous of these is the Old Proprietor, which, at low water, dries for the space of half an acre. When the wind, therefore, veers at all to the southward make the best of your way to St. John's; or you may secure an anchorage in Grand Passage, or St. Mary's bay, as it seldom blows in that direction above 18 hours without bringing on a fog. There is no difficulty in going through ANNAPOLIS GUT if you have but a commanding breeze, although the tide is very rapid, the flood and ebb running five knots an hour, and the eddies strong; about one-third through lies the *Man-of-War Rock*, about a cable's length from the eastern shore; therefore, if you keep in mid-channel you are sure to clear it.

The prevailing winds here, as in general on the coast of Nova Scotia, are from W. S. W. to S. W., nearly as steady as trade-winds, except during the summer months, when they become rather more southerly, accompanied with but little intermission of fog, which requires a N. Westerly wind to disperse. It is, therefore, recommended not to leave an anchorage without making proper arrangements for reaching another before dark, or the appearance of a fog coming on, which, with a S. W. wind, is so sudden that you become enveloped within it unawares; neither should you keep the sea at night, if you can possibly avoid it. Observe, whenever the wind blows directly off the land the fog will soon disperse.

CAPE COD TO BOSTON. There is a lighthouse erected at the Clay Ponds on Cape Cod, which exhibits a fixed light; it stands on elevated land, 150 feet high, which with the elevation of the lantern makes it 200 feet above high water mark. There is a new lighthouse also on the Race point, which shows a revolving light, and is therefore readily known from the other. Cape Cod is low sandy land; but Race point is very bold, and may be known by a number of fish-houses on it. If bound to Boston, and you want to fall in with Cape Cod, bring the light to bear S. W., 2 leagues distant, and then steer W. N. W. for Boston lighthouse; this stands on a small island, at the north side of the entrance of the channel, and is 82 feet high. In departing from Cape Cod you must calculate the tide, as the flood sets strongly to the S. W. Leaving Boston, your course to Cape

Cod is E. S. E., 13 leagues; and when within 2 leagues of the lighthouse, which is 9 miles further, and having brought it to bear S. W. you may steer to the S. E.

BANKS IN THE BAY OF FUNDY. CASHE'S LEDGE lies directly opposite to Massachuset's bay, in a right line between Machias bay and Cape Cod; it lies N. and S., 7 leagues, and E. and W., 2 leagues. The shoalest ground is in the centre, the length and breadth of which are about half a mile; it is exceedingly rocky, having 10 fathoms in some places, and only 4½ in other parts; in one spot there are only 2 fathoms. In general upon the bank the bottom is sand and ooze, with black stones and broken shells, till you get in 25 or 30 fathoms; it then becomes rocky. The current sets exceedingly strong and irregular, sometimes running all round the compass in less than an hour.

JEFFERY'S BANK. This is an extensive deep water bank of 30 to 60 fathoms, 16 leagues in length, N. E. and S. W., and 3 leagues in breadth; it commences about 7 or 8 miles to the southward of Mount Desert rock, and extends to about the longitude of 68° 45′ W. Outside of the bank the water deepens to 70 and 80 fathoms; and between it and the main are 70, 60, and 55 fathoms. There is no danger whatever on Jeffery's bank. ST. GEORGE'S BANK has already been described in a preceding section, agreeable to the last survey made by Captain Isaac Hall.

VESSELS BOUND TO NEW YORK, &c., in passing the shoal grounds on George's bank, should pass between them and the Florida stream, and should also keep between it and the Nantucket shoals: this precaution will shorten the passage, as you will have the advantage of the eddy current running contrary to the stream. Sandy Hook on the south side of the entrance to New York harbour is distinguished by a lighthouse, exhibiting a fixed light; on the False Hook, some distance to the northward of it, are also two beacons, serving, when illuminated, as a low light in the night. The entrance lies between Sandy Hook and the east bank, or shoal, that extends from the S. W. part of Long island; a bar extends wholly across it, the deepest water over which are 3½ and 3 fathoms, between the white and black buoys, which lie 2¾ miles to the E. N. E. of the lighthouse.

The Highlands of Neversink are a good mark to find the entrance of New York by day; they lie on the south side of the harbour, and may be seen 8 leagues off, from a depth of 30 fathoms. They appear at first like an island, rather level at the top, with some irregular risings towards Point Comfort on the west or inland side. Having made this part of the coast, you may run boldly within 3 miles of the beach, and in steering along to the northward, observe to keep in about 8 fathoms water until you get the lighthouse to bear W. ½ N., then if you have the round hill called Mount Pleasant, some distance within New Jersey in one with the land, about a quarter of a mile to the southward of the lighthouse you may pass the bar. Steer in W. by N. until you are over it, leaving the white buoy on the starboard side; you will here have 3½ fathoms, and when over will get into 4½ or 5 fathoms. Giving Sandy Hook a berth of about half a mile you will have 5 and 6 fathoms. Bringing the point, on which the beacons stand, to bear S. S. E. you may haul to the southward round the Hook, and come-to in five fathoms, the Hook bearing E. to N. E., distant 1 or 2 miles.

TO PHILADELPHIA. Having brought the lighthouse on Sandy Hook to bear W. N. W., steer E. S. E. 2 leagues, S. S. E. 4 leagues, and then S. S. W. about 5 leagues. This will take you abreast of Barnigate inlet, when there is a shoal extending 3 miles from the beach, which is steep-to, and may be passed in 6 fathoms, a pistol-shot from the outer breaker;

if in the night, it is recommended not to get into less than 9 or 10 fathoms. A S. W. by S. course, 9 leagues, takes you abreast of Great Egg harbour, which has a shoal bank off its south-side of only 6 feet water, extending a league from shore, and from thence, steer S. W. ½ W. 9½ leagues to Cape May, the north point of the entrance of the Delaware.

Cape May is distinguished by a lighthouse, 75 feet above the level of the sea; it exhibits a revolving light which may be seen 9 or 10 leagues; when at the distance of 7 or 8 leagues, the time of darkness will be twice to that of light; as you approach it, the time of darkness will decrease, and that of light increase, until you get within 3 leagues of it, when the light will not wholly disappear, but the greatest power of light will be to the least as 24 to 1. The lighthouse on Cape James, or Henlopen, on the south side of the entrance, has a regular fixed light; it is of an octagonal form, handsomely built of stone, 100 feet, and the ground on which it is erected is nearly as much above the level of the sea; it is lighted with 8 lamps, and may be seen 10 leagues off in clear weather. There is a *beacon light* on Cape Henlopen, about a mile from the great light in the sea, which was first lit in 1825. The two lights in one is the leading mark to carry vessels into the roads. Cape Henlopen is distant 5 leagues from Cape May. The greatest danger about the entrance of the Delaware, is the Cape May bank which is now distinguished by a *Light Vessel* moored off the S. W. side in 7½ fathoms, Cape May lighthouse bearing 20° 30′ N., distant 15¼ miles. The centre of the shoalest ground, on which is found 14 feet water, bears N. 28° E. from the light vessel 2¾ miles; it extends N. by E. ½ E. and S. by W. ½ W. three-quarters of a mile, and is half a mile in breadth, and very bold on its eastern edge; as there are 12 fathoms half a mile to the eastward of the shoal water, vessels coming from the northward should not run for the light ship while bearing between N. 14° E. and N. 41° E. South-east three-quarters of a mile from the vessels there are 5 fathoms water.

Vessels entering the Deleware from Cape Henlopen should bring the lighthouse W., and run for it until within two miles, when you will have 14 to 16 fathoms water, although at 5 leagues E. from the Cape there are only 6 and 7 fathoms. Having passed the lighthouse, bringing it to bear E. S. E., you may anchor in Whare Kill road, in 3 or 4 fathoms. To run up the bay bring the lighthouse to bear S., taking care to avoid the *sheers;* should you have the flood tide steer N. by E., but with an ebb N. by W., as the flood sets W. S. W., and the ebb the contrary. Proceeding in this manner 11 or 12 miles you will leave the *Brown* shoal, on which is a buoy, on the larboard hand, keep then a N. course until you bring Cape May to bear E. S. E., by which you will make the *Brandywine* on the starboard, also distinguished by a buoy, the channel between is not above a mile wide.

Next steer N. W. by N. or N. N. W. ½ W., and you will have 7 or 8 fathoms, leaving the Cross ledge, which lies 9 miles from the Brandywine, on the starboard hand. Nearly midway between the two lie the Fourteen feet and Ten feet banks, the former lying on the larboard, and the latter on the starboard side. With a fair wind these banks are not in the way, as they lie nearly N. W. by W. and S. E. by E. The Cross ledge is about 8 miles long, and has a small vessel with a mast in it for a buoy, which may be seen 2 or 3 leagues off. Having passed the buoy of the Middle shoal, which lies on the larboard side of the channel, steer N. W., 2 leagues, for the bar of Bombay Hook, which you must carefully avoid when the Hook bears N. W. or N. W. by W.: the bar lies 1½ mile out, and has only 6 feet at low water.

From the bar of Bombay Hook to Reedy island your course, with a leading wind, is N. W. by N., distance 13 miles; but be careful to avoid Stony Point ledge, that lies 4 or 5 miles S. E. from the island, which is partly dry at low water. This is to be left on the starboard side, and as the channel here is not more than 2 miles wide, be careful to avoid it, particularly with the wind ahead. Be cautious in passing Reedy island to avoid a long shoal that extends to N. N. W., one mile and a half in length; keep the larboard side best on board. You will next make a small low island on the starboard, which has a shoal flat to the northward, near 1½ mile in length, called the Pea patch; this will be avoided by keeping the larboard side on board until the river bears N. E. or N. E. by N., when you may stand up for Newcastle.

Newcastle is situated 10 leagues below Philadelphia; having passed a mile beyond it, take care to give the shore on the larboard side a berth, as a flat extends half a mile from it; keep then N. E. to E. N. E., in mid-channel, to Marcus Hook, and steer then N. E. by E., 4 miles, to Chester island; this you leave on the larboard, together with a long low point that lies W. S. W. from it. Give Chester island a wide berth, keeping the starboard shore best on board until you reach a high sandy bluff point at Billingsport; you will afterwards pass close to a black buoy, in the channel, as you sail up for Mudfort. Run directly for the port, but do not approach too near; when abreast of it you will perceive two small islands, between which you must pass, and afterwards haul up N. E. by N. to within a mile of Gloucester point. A northerly course for 3 miles, keeping the larboard side best on board, will then take you to Philadelphia.

Vessels from the southward, in making the entrance of the Delaware, should keep along the south shore, at the distance of about a mile, until they approach within 4 miles of Cape Henlopen; they should then edge off to avoid the Hen and Chicken shoal, the south end of which lies S. E. ½ E., 3 miles from the lighthouse, and extends 3 miles to the N. N. W., its north end bearing E. by N., 1½ mile from the lighthouse: there are 15 fathoms water near its east side.

ENTRANCE OF THE CHESAPEAKE. The entrance of the Chesapeake lies between Cape Charles on the north side, and Cape Henry on the south; the latter is distinguished by a lighthouse, the lantern of which is 120 feet above the sea, and exhibits a fixed light. Vessels approaching the Chesapeake, from the northward, should not stand inwards to a less depth than 7 fathoms until they reach Cape Charles, when they may approach as near as 5 fathoms. Vessels making land to the southward of Cape Henry should coast along, in 7 fathoms, towards the Cape, and when you fall in 8 or 9 fathoms, stiff, sticky bottom, you will be in the channel way.

Cape Henry is low, but bluff; the land about it is low and sandy, and cannot be seen above 7 leagues off; the Cape is rather steep-to, but a small shoal stretches about two cables' length from the shore, east of the lighthouse. The Middle ground lies about 4 miles from the Cape, though its outer part lies 10 miles N. E. by E. ½ E., and 9 miles S. E. by S. from Cape Charles; this must be carefully avoided in going in. With a northerly wind it may be approached in 5 fathoms; in the channel between it and Cape Henry are 15 and 16 fathoms. Run in with a fair wind, with the lighthouse bearing W. by N.; with a turning wind stand to the southward, until it bears N. W. by N., and to the northward until it bears W. by S.

Ships bound from the Delaware to the Chesapeake should give Cape Henlopen a berth of 3 or 4 miles; then steer S. S. E. about 13 leagues, and thence S. W. until you reach within 3 leagues of Cape Henry, by which the shoal ground off Cape Charles and the Senepuxen and Chingoteak shoals will be avoided; the Senepuxen shoal lies 10 leagues S. by E. ½ E. from Cape Henlopen, and has only 10 feet water on it. The Chingoteak is 3 leagues S. by E. from the other, and has but 13 feet water. Another small shoal lies W. ½ S., 3 leagues from Chingoteak island; and 3 leagues W. S. W. from this lies the north end of the *flat* that extends from the islands lying between Chingoteak and Cape Charles. Near the end of this flat are 5 fathoms; you may run along the edge of it in 4, 5, or 6 fathoms, the course about S. S. W. ½ W., and the distance, to abreast of Cape Charles, 20 leagues.

CHARLES HARBOUR. The entrance of Charleston harbour is distinguished by a lighthouse, the lantern of which is 85 feet above the sea; it was formerly a fixed light, but has since been altered to a revolving one, to distinguish it from that of Georgetown. The light may be seen 8 or 9 leagues; when first made the time of darkness will be twice that of light; as you approach the time of darkness will decrease, and that of light increase, until you get within 3 leagues of it, when the light will not wholly disappear; but the difference between the greatest and least light will be as 24 to 1.

The channel way in is to the southward of the harbour, between the North and South breakers, and is buoyed, the outer one lying on the N. E. end of the South breaker. Bring the lighthouse to bear W. by N. which will lead into mid-channel, and in which you will find from 12 to 17 feet water, according to the tide. The buoy, distinguished by a small white flag, lying in 10 feet water in the middle of the channel, may be passed on either side, but be cautious in proceeding that the tide may not set you out of your course, as the flood sets across the channel over the north breakers. Having arrived within half a mile of the lighthouse, you may anchor in 4 or 5 fathoms. The best time for entering Charlestone harbour is an hour and a half before high water. In sailing you must keep the breakers on board, but come not nearer than 7 or 6 fathoms, for they are steep, and from a depth of 6 fathoms you may in the next cast be on shore.

There is a ship channel to the southward of that already described, called the South, or Lawford's channel, having 10 to 12 feet water according to the tide; its course in is N. N. W., indicated by a buoy.

From the anchorage, called the Five Fathom Hole, the course is N. by E., 3½ miles, in 6 to 8 fathoms, to Cummins' point, which, having brought W., distant half a mile, change your course to N. N. W., to the west extremity of Sullivan's island, where you will have 8 to 10 fathoms. Sullivan's island is bold-to, and may be approached to within a quarter of a mile; the course from hence to Charleston is nearly W. ½ N., about 5 miles.

TIDES. It is high water on the full and change of the moon on the south side of the *Gulf of St. Lawrence*, 9¼ hours. The tide rushes with much rapidity through the Gut of Canso; in the narrowest part it seldom runs at a slower rate than 4 or 5 miles an hour. On the south shore of *Northumberland Strait* the time of flowing on the full and change is from 7 to 8 hours; the perpendicular rise is from 3 to 7 or 8 feet. The tides here are very materially varied by the winds; it has been found that at times the stream of the Gut of Canso has continued to run one way for many successive days. It is high water at St. John's, Newfoundland, at 6 o'clock; the tides rise 6 to 8 feet, but very irregular, being much influenced by the winds. At *Halifax* dockyard it is high water on the full and change at 8 o'clock; springs rise from 6 to 9 feet. *St. John's*, *New Brunswick*, at ½ past 11, springs rise 24 feet. *Cumberland basin* at 12, springs rise 60 feet. At the eastern side of *Manan island* at 10, springs rise 25, neaps 20 feet. In *Passamaquody bay* at 10¾, springs 30, neaps 24 feet. At *Annapolis Gut* at 10, springs rise 18 feet.

The tides at the entrance, and within the *Bay of Fundy*, are very rapid but regular, and although the wind against them alters the direction of the ripplings, and sometimes makes them dangerous, yet it has little or no effect upon their courses. The flood tide sets from Cape Sable to the northwestward through the Seal, Mud, and Tusket Bald islands, at the rate of 2 or 3 miles an hour, and in the channels among the islands it increases to 4 and 5 miles. From thence, taking the direction of the main land, it flows past Cape St. Mary, and then N. N. W. towards Brier's island; it runs up St. Mary's bay but slowly, which adds to its strength along the eastern shore, then increasing its rapidity as the bay contracts, it rushes in a bore into the Basin of Mines and up Clugnecto bay, so that here the water sometimes rises to the extraordinary height of 75 feet.

It is high water off *Boston* lighthouse at 10 o'clock; it flows off the town till a quarter of an hour past 11; the springs rise 16 feet perpendicularly, neaps 12 feet. It is high water off *Race point*, at 10¾ hours; on leaving Cape Cod for Boston you must calculate the tide, as the flood sets strongly to the S. W. At Sandy Hook at 7½ hours, but the stream of tide continues to set in, at the rate of 2 knots, until 9 hours. At New York, East river, it is high water at 9; in the north, or Hudson's river, at 11 o'clock: the vertical rise of tide is about 7 feet, but it is sometimes checked by the westerly or north-westerly winds, so as to lower the water on the bar to 3¼ fathoms; easterly or north-easterly winds have frequently raised it to 5 fathoms. The flood sets strongly to the westward from the S. W. spit, until above the Upper Middle, whence it runs up in the channel course to the Narrows.

In the *Delaware* it is high water, on the full and change of the moon, as follows:—Cape May, at 8¾ hours: Cape James, or Henlopen, at 9: Bombay Hook, 10½: Reedy island, 11¼: Newcastle, 12: Philadelphia, 3 o'clock. First quarter flood sets near the Capes W. N. W.; second to last quarter N. N. W.: first quarter ebb E. S. E.; second to last quarter ebb S. S. E. With spring tides the vertical rise is from 6 to 7 feet; neap tides 4½ to 5½, but varied by the winds. The flood tide runs in round Cape Henry, and into Lynhaven bay, until 11 o'clock, on the full and change, and out of the way of the *Chesapeake* stream it flows at 10; in Hampton road, at 10½. The tide varies considerably in its direction, according to the time from ebb or flood. The ebb from James and York rivers sets over the Middle Ground to the eastward, which renders the navigation thereabout dangerous in the night.

It is high water at *Charleston* at 7¾ hours. The depth of water on the bar at low water, neap tides, is 12 feet, at high water, neap tides, 17 feet; at low water, spring tides, 11 feet, high water 18½ feet. From thence towards Savanna it has been observed that N. E., E., and S. E. winds cause higher tides than other winds. At Port Royal the tide flows, in the full and change of the moon, at 8¼ hours. About 6 leagues from the land, in 12 fathoms water, the flood sets strongly to the southward, and the ebb to the northward; at a great distance from the shore there is no ebb at all. On Savanna bar there are 20 feet, at low water. At St. Mary's river it is high water at 8½ hours; the tide rises 6 feet at common, and 7 feet at spring tides.

VARIATION. The variation at St. John's, Newfoundland, is 28° W.: Cape Ray, 24°: Quebec, 15°: St. Paul's island, Gulf St. Lawrence, 21°: Gut of Canso, 16°: Halifax lighthouse, 13° 35′: Cape Sable, 11° 15′: Boston bay, 7° 40′: in New York harbour about 7°: off the Delaware 4°, and about the same off the Chesapeake.

SECTION XI.

GENERAL DESCRIPTION OF WINDS, TIDES, CURRENTS, &c.

A change in the temperature of a portion of air; an increase or a diminution of the quantity of water, which it holds in a state of vapour; in short, any circumstance which causes it either to contract or to expand, destroys the equilibrium subsisting among the different parts of the atmosphere, and occasions a rush of air, that is, a WIND, towards the spot where the balance has been destroyed.

WINDS may be divided into three classes—those which *flow constantly* in the same direction, those which are *periodical*, and those which are *variable*. It must be observed that the terms which express the direction of winds are employed in a sense quite contrary to that in which they are used when we speak of the direction of currents in the ocean; a westerly current, for example, signifies a current flowing towards the west, but a westerly wind signifies a wind coming from that quarter.

The PERMANENT WINDS are those which blow constantly between, and a few degrees beyond the tropics, and are called TRADE-WINDS. On the north of the equator their direction is from the north-east (varying at times a point or two of the compass each way); on the south of the equator they proceed from the south-east. The origin of them is this:—the powerful heat of the torrid zone rarefies or makes lighter the air of that region; the air, in consequence of this rarefaction, rises, and, to supply its place, a colder atmosphere from each of the temperate zones moves towards the equator. But (as in the case of the polar currents in the ocean) these north and south winds pass from regions where the rotatory motion of the earth's surface is less to those where it is greater. Unable at once to aquire this new velocity they are left behind, and instead of being north and south winds, as they would if the earth's surface did not turn round, they become north-east and south-east winds. The space included between the second and fifth degree of north latitude is the internal boundary of the two winds; and this space experiences calms, frequently interrupted, however, by violent storms. The reason why it is situated to the north of, instead of exactly at, the equator, seems to be that the northern hemisphere is warmer than the southern; for since the trade-winds are the result of the continual ascent of heated air in the equatorial parts, their internal boundary will be where the principal ascent is going on—that is, where the annual temperature is the highest, which, on account of the above-mentioned inequality of temperature in the two hemispheres, will not be at the equator, but somewhat to the north of it. The external limits of the trade-winds are at a medium in about the 30° of North and South latitude respectively; but each limit, as the sun approaches the neighbouring tropic, declines further from the equator. The position of the sun has an influence also on their strength and direction; for when that luminary is near the Tropic of Cancer, the South-east wind becomes gradually more southerly and stronger, and the North-east weaker and more easterly; the effect is reversed when he gets towards the Tropic of Capricorn.

The TRADE-WINDS would blow regularly round the whole globe within the distance of about 30° or 40° from the equator each way, if the space within those limits were all covered with water; but the uneven surface and unequal temperature of the land divert and derange them; it is on this account that the trade-winds are constantly experienced only over the open ocean. The larger expanse of ocean over which they range, the more steadily they blow; thus in the Pacific they are commonly more steady than in the Atlantic ocean, and in the South than in the North Atlantic. In sailing from the *Canaries* to *Cumana*, on the north coast of South America, it is hardly ever requisite to touch the sails of the vessel. The voyage across the Pacific, from *Acapulco* on the west coast of Mexico to the *Phillippine islands*, is performed with equal facility; and if there were a channel through the Isthmus of Panama, a westward passage from *Europe* to *China* would be more speedy and safe than the usual navigation thither round the *Cape of Good Hope*; the only interruption to the evenness of this voyage would be in the Carribean sea and the Gulf of Mexico, where the trade-wind blows impetuously, and is sometimes interrupted by westerly winds. It would not be possible, however, to return by the same route, because in sailing east way must be made to the northward, in order to get beyond the region of the trade into that of the variable winds. Both in the Atlantic and in the Pacific ocean the current of the trade-winds becomes broader and more directly east in its course, as it advances from one side to the other of those extensive basins. On the West Coast of Africa, owing to the rarefaction which the air undergoes over that continent, the wind is mostly turned towards the shore; from Cape Bojador to Cape Verd it is generally north-west, and thence to the island of St. Thomas, under the equator, it bends gradually first to the west and then to the south-west; along the coasts of Chili and Peru a south wind prevails: these are two instances of the interruption which the trade-winds experience in the neighbourhood of large masses of land.

In the Indian ocean the south east trade-winds prevail between 28° and 10° of south latitude, from within a few degrees of the east side of Madagascar, nearly to the coast of New Holland; but from 10° South latitude to the northern shores of that ocean the uniformity of the tropical movements of the atmosphere is destroyed by the monsoons, which belong to the class of periodical winds. These blow half the year from one quarter, and the other half from the opposite; winds and violent storms prevail for a time which render it dangerous to put to sea. They of course suffer partial changes in particular places, owing to the form and position of the lands, and to other circumstances, but it will be sufficient to give their general limits and directions. Northward from the third degree of south latitude, a south-west wind blows from April to October—from October to April a north-east: these monsoons extend over the China sea, but here they incline more to the direction of north and south. Between 3° and 10° South latitude, a north-west wind blows from October to April, and a south-east during the other six months of the year; the former is seldom steady in the open sea, but in December and January it sometimes extends northwards a degree or two beyond the equator. These two monsoons have the greatest strength and regularity in the Java Sea, and thence eastward towards New Guinea. The facts above exhibited may be thus summed up: from April to October a south-west wind prevails north of the equator, southward of this a south-east wind from October to April, a north-east wind north of the equator, and a north-west between the equator and 10° South; south of this the usual trade-wind, which is in motion through the whole year.

In attempting to account for these movements of the atmosphere over the Indian ocean, the first thing which strikes us is, that the north-east and south-east monsoons, which are found the one on the north and the other on the south side of the equator, are nothing more than the trade-winds blowing for six months, and then succeeded for the remainder of the year by winds directly opposite. It is also to be noticed that the south-west monsoon in the northern, and the north-west monsoon in the southern, hemisphere, each prevails while the sun is perpendicular to their respective regions; they are, therefore, connected with the immediate presence of that luminary. If the Indian ocean were not bounded as it is by land on the north, the trade-winds would blow over it (at least in the central parts) as they do in the Atlantic and Pacific oceans; but it is well known that water, owing to its transparency, is very little warmed by the sun's rays, whereas the land is powerfully heated by them; consequently, when the sun is between the equator and the Tropic of Cancer, India, Siam, and the adjacent countries, become much hotter than the ocean; the air over them gets rarefied and ascends, colder air then rushes in from the Indian ocean, and a south-west wind is produced. When the sun, however, has crossed to the south of the equator, these countries become gradually cool, and the north-east trade-wind resume their course. At the same time the north-west monsoon commences in the southern hemisphere, in consequence of the air over New Holland being rarefied by the presence of the sun.

The monsoons in the Red Sea blow in the direction of the shores; and a similar effect is observed in the Mozambique Channel, between Africa and Madagascar, where these winds follow the line of the channel. On the Coast of Brazil, between Cape St. Augustine and the island of St. Catherine, and in the bay of Panama, on the west of the isthmus of that name, periodical winds occur somewhat similar to the monsoons of Asia.

The land and sea breezes, which are common on the coasts and islands situated between the tropics, are another kind of periodical winds. During the day the air, over the land, is strongly heated by the sun, and a cool breeze sets in from the sea; but, in the night, the atmosphere over the land gets cooled, while the sea, and consequently the air over it, retains a temperature nearly even at all times: accordingly, after sunset, a land-breeze blows off the shore. The sea-breeze generally sets in about ten in the forenoon, and lasts till six in the evening; at seven the land-breeze begins, and continues till eight in the morning, when it dies away. These alternate breezes are, perhaps, felt more powerfully on the coast of Malabar than anywhere—their effect there extends to a distance of twenty leagues from the land. During summer, the sea-breeze is very perceptible on the coasts of the Mediterranean, and sometimes even as far north as Norway.

We thus perceive that within the limits of from 28° to 30°, on each side of the equator, the movements of the atmosphere are carried on with great regularity; but, beyond these limits, the winds are extremely variable and uncertain, and the observations made have not yet led to any satisfactory theory by which to explain them. It appears, however, that beyond the region of the trade-winds, the most frequent movements of the atmosphere are from the south-west in the north temperate zone, and from the north-west in the south temperate zone. This remark must be limited to winds blowing over the ocean, and in maritime countries; because those in the interior of continents are influenced by a variety of circumstances, among which the height and position of chains of mountains are not the least important. These south-west and north-west winds of the temperate zones are most likely occasioned in the following manner:—in the torrid zone there is a continual ascent of air, which, after rising, must spread itself to the north and south, in an opposite direction to the trade-winds below: these upper currents, becoming cooled above, at last descend and mix themselves with the lower air; part of them may, perhaps, fall again into the trade-winds, and the remainder, pursuing its course towards the poles, occasion the north-west and south-west winds of which we have been speaking. It has also been conjectured that these winds may frequently be caused by a decomposition of the atmosphere towards the poles, from part of the air being at times converted into water.

HURRICANES. Hurricanes have been supposed to be of electric origin. A large vacuum is suddenly created in the atmosphere, into which vacuum the surrounding air rushes with immense rapidity, sometimes from opposite points of the compass, spreading the most frightful devastation along its track, rooting up trees, and levelling houses with the ground. They are seldom experienced beyond the tropics, or nearer the equator than the 9° or 10° of latitude; and they rage with the greatest fury near the tropics, in the vicinity of land or islands, while far out in the open ocean they rarely occur. They are most common among the West India Islands, near the east coast of Madagascar, the islands of Mauritius and Bourbon, in the bay of Bengal at the changing of the monsoons, and on the coasts of China.

WHIRLWINDS. Whirlwinds sometimes arise from winds blowing among lofty and precipitous mountains, the form of which influences their direction, and occasions gusts to descend with a spiral or whirling motion. They are frequently, however, caused by two winds meeting each other at an angle and then turning upon a centre. When two winds thus encounter one another, any cloud which happens to be between them is, of course, condensed and turned rapidly round; and all substances sufficiently light are carried up into the air by the whirling motion which ensues.

WATER-SPOUTS. The action of a whirlwind at sea occasions the curious phenomenon called a Water-spout, which is thus described by those who have witnessed it. From a dense cloud a cone descends in the form of a trumpet, with the small end downwards; at the same time the surface of the sea under it is agitated and whirled round, the waters are separated into vapour, and ascend with a spiral motion till they unite with the cone proceeding from the cloud; frequently, however, they disperse before the junction is effected. Both columns diminish towards their point of contract, where they are not above three or four feet in diameter. In the middle of the cone, forming the water-spout, there is a white transparent tube, which becomes less distinct on approaching it, and it is then discovered to be a vacant space in which none of the small particles of water ascend; and in this, as well as around the outer edges of the water-spout, large drops of rain precipitate themselves. In calm weather, water-spouts generally preserve the perpendicular in their motion; but, when acted on by the winds, they move on obliquely; sometimes they disperse suddenly, at others they pass rapidly along the surface of the sea, and continue a quarter of an hour or more before they disappear. A notion has been entertained that they are very dangerous to shipping, owing to the descent, at the instant of their breaking, of a large body of water sufficient to sink a ship; but this does not appear to be the case, for the water descends only in the form of heavy rain. It is true that small vessels incur a risk of being overset, if they carry much sail; because sudden gusts of wind, from all points of the compass, are very common in the vicinity of water-spouts.

TIDES.

The Tides proceed from the attractive forces of the sun and moon, which diminish the gravity of the waters of the ocean, or, which is the same thing, draw or lift up the waters toward themselves.

The moon, on account of her nearness to our planet, has the most powerful effect upon the tides; it is calculated that her influence is nearly triple that of the sun. The sun, however, acts upon the ocean in the same manner, though in a less degree. When these two bodies unite their influence, which they do at the seasons of new and full moon, the tides naturally rise the highest, and are then called spring tides; but, when the moon is in her quadratures, or quarters, the action of each of the two luminaries is directly opposed to that of the other; the tides are then, of course, the lowest, and are called neap tides. During the moon's circuit round the earth, the spring and neap tides each occur twice, and one after the other.

As the moon crosses the meridian of a place about every twenty-four hours fifty minutes and a half, the sea in that space of time ebbs and flows twice all over the world, although much less towards the poles than within the tropics, where the waters are under the direct line of the lunar attraction.

Were it not for the reasons hereinafter mentioned it would be high water, at any place in the open sea, when the moon is upon the meridian of that place, and low water when the moon is upon a circle, cutting the meridian in question at right angles; but, in fact, the greatest and least heights of the water at such a place do not occur till about three hours after. The delay is thus explained: the elevated parts of the sea have received such an impulse towards ascent, that they continue to rise after the earth's rotation has carried them from under the line of the direct attraction of the moon; this impulse being also aided, for a time, by the moon continuing to attract the water upwards, though in a less degree.

If the earth were entirely covered by a sea of uniform depth, and the sun and moon moved always in the plane of the equator, the region of the highest tides would always be directly under the equator, while at the poles there would never be any tide whatever. But the changes that occur in the positions of the sun and moon, and several other circumstances, prevent the tides from taking place in so uniform a manner.

It must, at the same time, be kept in view, that, whenever the sun and moon are not situated at the same distances from the equator, so that the circles of their highest tides do not coincide, or fall together, allowance must be made for their attractive forces counteracting, in some degree, each other's effects upon the ocean; and as the moon completes her range, on each side of the equator, in about 29½ days, while the sun, to complete his, takes nearly 365¼ days, their combined motions must produce continual irregularities in the tides. Taking one year with another, the mean monthly range of the moon, on each side of the equator, is the same as the annual range of the sun (23° 28′); the highest tides are, consequently, within the tropics, and the least within the arctic and antarctic circles.* Within the tropics the flood tides pass from east to west (following the apparent course of the sun and moon) but, as the torrid zone is the seat of the highest tides, the flood in the northern temperate zone comes from the south, and in the southern temperate zone from the the north. To this rule there are, nevertheless, local exceptions, caused by those derangements of the tide which we are now going to mention.

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* It has been already stated that it is high water at any place twice in every 24 hours 50½ minutes. When a place is on the *same side* of the equator as the moon, the tide, which is produced while the moon is *above* the horizon of the place, will *exceed* the tide which is produced while the moon is *under* the horizon of the place; but, when a place is on the opposite side of the equator to the moon, the effect is exactly the reverse. Thus, when the moon is *north* of the equator, a place under a parallel of *north* latitude will have its *greatest high water* when the moon is *above* the horizon; but a place under a parallel of *south* latitude will have its *greatest high water* when the moon is *below* the horizon. When the moon is *south* of the equator, these effects will be just reversed. In summer, when the sun's declination is considerably north, the afternoon tides, *north* of the equator, are higher than the morning tides; in winter the morning tides exceed those of the afternoon.

Of all irregularities in the tides, those are the greatest which are occasioned by the obstacles offered by the land to the ebb and flow of the waters. The impediments created by shallows in the ocean, and by the shores, bays, gulfs, and promontories of islands and continents are such, that the tides are greatly delayed, altered both in degree and in direction, and in many places so accumulated, that they rise to heights far exceeding what is witnessed in the open ocean. On the coasts of the islands of the South Sea, there are regular tides of only one or two feet in elevation; but, on the western shores of Europe, and on the eastern shores of Asia, the tides are very strong, and have many variations. On the northern coasts of France, the flow being confined in a channel, and repelled also by the opposite coasts of England, rises to a surprising height,—at St. Maloes, in Bretagne, it is said, even to 50 feet. The tide of the German Ocean is twelve hours in travelling from the mouth of the Thames to London Bridge, where it arrives about the time that there is a new tide in the German Ocean. This is one instance, out of the many, of the effect produced upon the tide when it has to pass along a narrow channel, and to overcome an opposing current.

The explanation that has been given of the manner in which tides are created in the ocean, will enable us to perceive why it is that, in some gulfs and inland seas, there are either no tides, or such trifling ones as to be scarcely discernible. In small collections of water the moon acts with the same line of attraction, or nearly so, upon every portion of the surface at once, and, therefore, the whole of the waters being equally elevated at the same period, no part of them is ever higher than the other. This is one reason why the Baltic has no perceptible tides, and why even those of the Mediterranean are hardly visible.* But, in addition to this, the two seas in question are so circumstanced that they cannot receive tides from the Atlantic: 1st, because their entrances are not turned towards the main direction of the Atlantic tide; 2ndly, because their entrances are so narrow, that the quantity of tide which that ocean can, in a few hours, impel into them, is insufficient, after being spread over the extensive surfaces of the two seas, to raise their level at all perceptibly. The Greeks who accompanied Alexander the Great in his expedition to the east, having never been on any other coasts than those of the Mediterranean, were seized with complete consternation on first beholding the retreat of the strong tide which the Indian Ocean sends into the river Indus. In gulfs which are differently circumstanced with respect to the direction of their entrances, and which have openings wider, as compared with their extent, the tides propagated from the ocean are sensibly felt. Hudson's and Baffin's bays, and the Red Sea, are examples which prove the correctness of this observation.

Currents and winds (especially the latter) have, according to their direction, an influence either in quickening or retarding the tide; indeed a powerful wind will sometimes keep a tide out of very narrow channels.

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* The little tide which there is in the Mediterranean seems to be formed chiefly on the part extending to the east of Malta, and to proceed northward into the Gulf of Venice. M. D'Angos observed that, at Toulon, on the coast of France, the sea rose a foot, about 3 hours and a half after the moon passed the meridian.

On the contrary, a strong wind coming from the same quarter as the tide, will raise it several feet above its usual level.

The causes which render the movements of the tides complex and irregular, may thus be summed up under four heads—1. The variations in the positions of the sun and moon, with respect to the equator and to each other; 2, the obstacles presented by the land; 3, by winds; and 4, by currents. The existence of these causes render it impossible to lay down any general rule for calculating the level, either of high or of low water, in different latitudes.

CURRENTS.

Currents in the ocean may be occasioned in various ways: they may arise from an external impulse (a gale of wind for instance); from a difference in temperature or saltness between two parts of the sea; from the periodical melting of the polar ice, or from the inequality of the evaporation which the surface of the sea undergoes in different latitudes. These causes may produce constant or occasional currents, and, according as they act in concert or in opposition, will their effects be various.

The most remarkable currents are those which continually follow the same direction. There is one which sets regularly from each of the poles towards the equator; and when we get within 28° or 30° of the line on either side, a general movement is observed in the ocean, in a direction nearly from east to west. The existence of the two polar currents is proved by the floating of masses of ice from the frigid into the temperate regions: these masses are, at times, seen as low as the 45°, or even the 40°, of latitude.

It was the opposition of the polar current which principally occasioned the failure of the attempt made by *Captain Parry* to reach the north pole; before they desisted from their efforts, the expedition found that, as they advanced over the ice, they were being drifted southward, at a rate faster than that at which they were travelling northward. It is equally certain that a tropical current exists. Judging not only from the direction of bodies floating on the water, but also from the circumstance that vessels, in crossing from Europe to America, descend to the latitude of the Canary islands, where they fall into a current and are carried rapidly to the west. In going from America to Asia, across the Pacific, a similar effect is observed. It might be supposed that this was due solely to the trade-winds, but such is not the case; for it is quite possible to distinguish their effect from that of the currents, since the progress of the vessel is quicker than it could be with the aid of the wind alone.

The origin of the polar currents is, no doubt, in great measure, to be referred to the centrifugal force which is the result of the earth's rotation. It may be further explained, when we reflect that the water towards the poles, both on account of its lower temperature and its being less attracted by the heavenly bodies, is heavier than the water in the tropical regions, and moreover, that the heat of the torrid zone occasions a much more powerful evaporation of the sea than is elsewhere experienced: the consequence is, that the waters nearer the poles will move towards the equator, in order to restore the equilibrium which has, in these several ways, been destroyed. The tropical current may also, in another manner, be explained as proceeding from the earth's rotation. The waters, as they advance from the polar seas, pass from regions where the rotatory motion of the earth's surface is very slight, to those where it is exceedingly rapid; they cannot immediately acquire the rapid motion with which the solid parts of the earth revolve in the tropical regions, and they are, accordingly, left rather behind, that is to the westward (the earth turning round from west to east). The ocean, consequently, appears to retreat from the western, and advance upon the eastern coasts of the continents, or, in other words, to have a general movement from east to west; and the effect is very much assisted by the constant blowing of the trade-winds.

We will now explain the modifications, or changes, which this grand movement in the ocean undergoes, in consequence of the obstacles presented by the land to its free progress. When it meets with shores or narrow straits to impede or turn aside its course, it forms strong and even dangerous currents. The eastern coast of America, and the West India islands, constitute a sort of dyke to the general westward motion of the Atlantic; and it will be seen, if we refer to a map, that from Cape St. Roque, in about 5° South latitude, the coast of South America stretches away in a continued line to the north-west, as far as the isle of Trinidad. Owing to this shape of the coast the waters, as far as 10° South, are, when they approach America, carried away in a current to the north-west. This current afterwards enters the Gulf of Mexico, through the strait formed by the western end of Cuba and the opposite peninsula (from this part it is called, by navigators, the GULF-STREAM) and follows the bendings of the Mexican coast, from Vera Cruz to the mouth of the Rio del Norte, and thence to the mouths of the Mississippi, and the shoals west of the southern extremity of Florida. It next takes a new direction to the north, and rushes impetuously into the Gulf of Florida. M. Humboldt observed in the month of May, 1804, in the 26° and 27° of latitude, that its velocity was eighty miles in twenty-four hours, although, at the time, there was a violent wind against it.

At the end of the Gulf of Florida (north latitude 28°) it runs to the north-east, at the rate, sometimes, of five miles an hour. It may always be distinguished by the high temperature* and saltness of its waters, their indigo-blue colour, and the quantity of sea-weed floating on the surface, and also by the heat of the surrounding atmosphere. The rapidity and temperature of the Gulf-stream diminish towards the north, while, at the same time, its breadth increases.† Its further progress northward is at last checked by the southern extremity of the Great Bank at Newfoundland, in 42° N., where it turns suddenly to the east. It afterwards continues moving towards the E. and the E. S. E. as far as the Azores; and thence it turns towards the Straits of Gibraltar, the isle of Madeira, and the group of the Canaries, till, on reaching the parallel of Cape Blanco, it completes the round by mixing with the grand westerly current of the tropics. It is probable however, that a branch still keeps on its course to the south and south east, along the coast of Africa: and it is well known that ships, if they approach too near the shore, are drawn into the Gulf of Guinea, and with difficulty get out again. We thus see that between the parallels of 11° and 43°, the waters of the Atlantic are carried on in a continual whirlpool. Humboldt remarks that, "Supposing a particle of water to return to the same place from which it departed, we can estimate, from our present knowledge of the swiftness of currents, that this circuit of 3,800 leagues is not terminated in less than two years and ten months. A boat, which may be supposed to receive no impulse from the winds, would require thirteen months, from the Canary islands, to reach the coast of Caraccas; ten months to make the tour of the Gulf of Mexico and reach Tortoise shoals, opposite the port of the Havannah; while forty or fifty days might be sufficient to carry it from the Straits of Florida to the Bank of Newfoundland. It would be difficult to fix the rapidity of the retrograde current from this bank to the coasts of Africa: estimating the mean velocity of the waters at seven or eight miles in 24 hours, we find ten or eleven months for this last distance." It is a curious fact, that towards the close of the fifteenth century, before Europeans were acquainted with the existence of America, two bodies, belonging to an unknown race of men, were cast, by the Gulf-stream, on the coasts of the Azores, and pieces of bamboo were brought, by the same current, to the shore of the same island of Porto Santo; by these circumstances, Columbus is said to have been strengthened in his conjectures with respect to the existence of a Western Continent.

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* Humboldt observes that "The waters of the Mexican Gulf, forcibly drawn to the north-east, preserve their warm temperature to such a point, that at 40° and 41° of latitude, he found them at 72½° (Fahrenheit); when out of the current, the heat of the ocean, at its surface, was scarcely 63½°. In the parallel of New York (41° N.) the temperature of the Gulf-stream is, consequently, equal to that of the seas of the tropics in the 18° of latitude."

† Its breadth in latitude 28½° is seventeen leagues (3.46 miles to a league); in the parallel of Charles Town (33° nearly) from 40 to 50 leagues; and on the meridian of Corvo and Flores, the westernmost of the Azore islands, it is one hundred and sixty leagues.

An arm of the Gulf-stream, in the 45° and 50° of latitude, runs to the north-east, towards the coasts of Europe, and becomes very strong when the wind has blown long from the west. The fruit of trees, which belong to the American torrid zone, is, every year, deposited on the western coasts of Ireland and Norway; and on the shores of the Hebrides are collected seeds of several plants, the growth of Jamaica, Cuba, and the neighbouring continent. The most striking circumstance, perhaps, is that of the wreck of an English vessel, burnt near Jamaica, having been found on the coast of Scotland.

There are various currents in the Pacific and Indian oceans. The general westward motion of the former is impeded by a numerous archipelago, and hence it receives different directions. A strong current sets to the west through each of the two straits, which respectively separate New Holland from New Guinea and from Van Dieman's Land. It then gets diverted, and flows northward, along the bottom of the coast of Sumatra, till it reaches the Bay of Bengal. The following appears to be the reason of its taking this course:—the general impetus of the Pacific towards the west, being encountered by New Holland and the numerous East India isles, is broken and dispersed; while the westerly motion of the Indian sea has not, in so early a stage, acquired much strength; the polar current, from the south, at the same time presses upon the wide opening which the Indian sea presents to that quarter, and the waters on the eastern verge of that sea are, therefore, pushed into the Bay of Bengal. In the neighbourhood of Ceylon and the Maldive islands, however, the tropical motion has become powerful enough to resist the polar current. The westerly current then recommences, but is again turned out of its line, and made to flow to the south-west, by the chain of islands and shallows which reaches from the extremity of the Indian peninsula to Madagascar. After passing Madagascar, it dashes against Africa, and, at the termination of that continent, mingles with the general motion of the waters.

A current afterwards sweeps from the Atlantic into the Pacific ocean, through the Straits of Magalhaen. There can be little doubt that this is a branch of the general current from the south pole; though, at the same time, it may be partly the result of the westerly movement of the Atlantic, which being checked by the shores of Brazil, flows to the south-west, along the South American coast.

There is a question connected with the currents of the Arctic ocean, which has engaged a good deal of attention, and been considered difficult to explain: it is from what quarters the timber can come, which is found floating on the polar seas, in such large quantities, and so much of which is thrown ashore on the northern side of Iceland.* The few specimens seen of the growth of Mexico and Brazil must have travelled to the north, by means of the Gulf-stream, of which we have spoken; the rest (principally pines and firs) most likely comes from Siberia and North America, along the shores of which it is drifted till it arrives at the opening into the Atlantic, in the midst of which Iceland is placed.

The existence of under currents different from, and even opposite in their direction to, those on the surface, is, by no means improbable, in some cases, though it is a matter not admitting proof. It has been thought that the Mediterranean, which has a strong flow always setting into it through the Straits of Gibraltar, sends back a portion of its waters into the Atlantic, by a concealed current. Contrary currents, passing along side by side, are not uncommon. In the Cattegat a northern current flows out of the Baltic, along the coast of Sweden, while a southern one enters the Baltic along the coast of Denmark. When two opposite currents, of about equal force, meet one another, they sometimes, especially in narrow channels, turn upon a centre, and assume a spiral form, giving rise to eddies or whirlpools. The most celebrated of these are the Euripus, near the island of Eubœa, in the Grecian Archipelago; Charybdis, in the strait between Italy and Sicily; and the Maelstroom, off the coast of Norway. The most violent of them, when agitated by tides or winds, become very dangerous to navigation.

ON THE OCEAN—ITS SALTNESS AND TEMPERATURE.

THAT vast body of water which surrounds the continents, and is the common receptacle of their running waters, is indispensably necessary to the support of animal and vegetable existence upon the earth. Its perpetual agitations purify the air, and the vapours, which the atmosphere draws up from its surface, being condensed and dispersed through the upper regions, form clouds, which are the source of a constant supply of rain and moisture to the land. The ocean also, by the facilities for communication which it offers, is the means of uniting the most distant nations, while it enables them to interchange, with mutual advantage, the productions of their several climates.

The bottom of the sea appears to have similar inequalities to the surface of the continents; the depth of the water is, therefore, extremely various. There are vast spaces where no bottom has been found; but this, of course, does not prove that the sea is bottomless, because the line is able to reach but a comparatively small depth. Lord Mulgrave, in the Northern Ocean, let down a very heavy sounding lead, and gave out with it nearly 4,700 feet of rope without finding the bottom; and Mr. Scoresby mentions having sounded in the Greenland sea as much as 7,200 feet. Such experiments, however, must be of very doubtful character; it is well known how much more easily bodies may be moved along in the water than in the atmosphere, and, consequently, any current would be sufficient to carry the lead with it, and so draw the rope out of a perpendicular direction. If we were to found our opinion upon analogy, we might conclude that the greatest depth of the ocean is, at least, equal to the height of the loftiest mountains, that is, between 20,000 and 30,000 feet.

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* From the account which Captain Parry has given of his voyage, it appears that there is also a great quantity of timber, which has been cast by the sea upon the northern coast of Spitzbergen.

The level of the sea, if it were not for the action of external causes, would be the same everywhere at the same instant, owing to the equal pressure exerted by the particles of a fluid upon each other in every direction. The figure assumed by the ocean would, therefore, exhibit the true surface of our planet, that of an oblate spheroid. But it is evident that no general level of this kind can ever exist, because the tide at any given moment is at very different heights in different parts of the ocean. The level is also continually being disturbed by the operation of the winds in particular regions. Independent, however, of these circumstances, it would appear that in gulfs and inland seas, which have only a slight communication with the ocean, the level of the water is usually more elevated than in the latter. This seems to be more especially the case if the only openings of these gulfs are towards the east; and it is attributed with reason to the accumulation which arises from the water being driven into these confined inlets by the general movement to which allusion will be made presently. When the French engineers were in Egypt, they made observations, according to which the waters of the Red Sea, on the east side of the Isthmus of Suez, were 32½ feet higher than those of the Mediterranean, on the opposite shore of the same isthmus. M. Humboldt made observations of a similar kind upon the Isthmus of Panama, and his conclusion is, that the waters of the Gulf of Mexico are from 20 to 23 feet higher than those of the Pacific on the other side. Of certain inland seas the level varies with the seasons; the Baltic and the Black Sea, which are in fact almost lakes, swell in the spring, from the abundance of water brought down to them at that period by the rivers.

The general colour of the sea is a deep bluish green, which becomes clearer towards the coasts. This colour is thought to arise entirely from the same cause as the azure tint of the sky; the rays of blue light, being the most refrangible, pass in the greatest quantity through the water, which, on account of its density and depth, makes them undergo a strong refraction. The other colours exhibited in parts of the sea depend on causes which are local, and sometimes deceptive. The Mediterranean, in its upper part, is said to have, at times, a purple tint. In the Gulf of Guinea the sea is white; around the Maldive islands it is black; and in some places it has been observed to be red. These appearances are probably occasioned by vast numbers of minute marine insects, by the nature of the soil, or by the infusion of certain earthy substances in the water. The green and yellow shades of the sea proceed, frequently, from the existence of marine vegetables at or near the surface.

The water of the sea contains several extraneous substances, in proportions varying in different places. The component parts, in addition to pure water, are commonly muriatic or marine acid, sulphuric acid (vitriol) fixed mineral alkali, magnesia, and sulphurated lime. By boiling, or evaporation in the air, common salt (muriate of soda) is obtained, which for salting meat is preferred to the salt of springs. The saltness of the sea appears, with some local exceptions, to be less towards the poles than near the tropics; but the difference is very slight, and perhaps the observations made are not sufficiently numerous to justify any positive general conclusions. Some observations which have been made tend to prove that the sea is less salt at the surface than towards the bottom.

The degree of saltness, in particular parts of the sea, frequently varies from temporary causes. The violent tropical rains have an effect in diminishing it, especially near coasts, where an increased volume of fresh water is brought down by the rivers. The Baltic is, at all times, less salt than the ocean, and, when a strong east wind keeps out the North Sea, its waters are said to become almost fit for domestic uses. The most curious phenomenon of all is that of springs of fresh water rising up in the midst of the sea; Humboldt mentions that in the Bay of Xagua, on the southern coast of Cuba,—springs of this kind gush up with great force at the distance of two or three miles from the land.

The bitterness which exists in sea water, but apparently not beyond a certain depth, is, with much probability, considered to be owing to the vegetable and animal matter held there in a state of decomposition.

Water being a bad conductor of heat, the temperature of the sea changes much less suddenly than that of the atmosphere, and is by no means subject to such extremes as the latter.* It may safely be affirmed that the temperature never, in any season, or under any latitude, exceeds 85° or 86° of Fahrenheit. The existence of banks or shallows has a local effect in diminishing the temperature of the ocean, but the great agents in modifying it are currents, which mingle together the waters of different depths and regions. Thus the Gulf Stream, as it is termed, which sets into the Gulf of Mexico, is much warmer than the neighbouring parts of the sea: the current of Chili is just the reverse.

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* The effect of the sea is to equalize temperature, so that a maritime country is not liable to such extremes, either of heat or cold, as an inland one. The sea itself being of a very equable temperature, the winds which pass over an extent of it partake somewhat of the same character. When a cold wind passes over sea it receives part of the warmth of the water, the upper particles of which being thus rendered cooler, and consequently heavier than those below, descend and are succeeded by warmer particles; so that there is a continual tendency in the sea to temper a cold wind passing over its surface. A cold wind, blowing overland, is at first rendered warmer by the earth's surface; but this surface quickly becoming cooled, ceases to have any effect upon the wind, which, therefore, travels on with undiminished rigour. Again, a warm wind, in passing over the sea, is cooled by the agitation which it produces, bringing up cooler water from below, as well as by the constant evaporation which it occasions; the surface of the water also cannot, as that of the land, be powerfully heated by the sun's rays, because it affords them a free passage, and therefore it cannot communicate heat to the atmosphere in the degree which the land does. From these circumstances it results that, though a place situated inland and another upon a coast may have the same mean annual temperature, the range of the thermometer at each will be very different; the summers of the latter will be cooler, and the winters milder than those of the former. It is from this cause that islands are so much more temperate than continents. It follows, too, that countries in our hemisphere will be rendered warmer by having large tracts of land to the south, and sea to the north; and cooler when the relative position of these two is reversed. This fact is exemplified by a comparison of the climate of India with that of Africa, north of the equator, the heats of the former country being much more supportable than those of the latter. Not only the temperature of a wind, but also its degree of moisture, depends upon the nature of the surface over which it passes. A wind coming up from the ocean is loaded with vapours, but one sweeping over an extent of land is rendered dry and parching. This explains to us why, in our own island, a south-west and an easterly wind are so opposite in character.

TABLES OF THE TEMPERATURE OF THE ATLANTIC OCEAN, IN DIFFERENT DEGREES OF LONGITUDE.

No. 1.

Latitude.	Longitude.	Temperature at the Surface.	Period of the Observation.	Observers.	
39° 10′ N.	16° 18′ W.	59° 00′ Fahr.	Between June 9th and July 15th, 1799.	Humboldt	These experiments were made during a passage from Spain to the New Continent.
34 30	16 55	61 34			
32 16	17 4	63 86			
30 36	16 54	65 48			
29 18	16 40	66 74			
26 51	19 13	68 00			
20 8	28 51	70 16			
17 57	33 14	72 32			
14 57	44 40	74 66			
13 51	49 43	76 46			
10 46	60 54	78 44			

No. 2.

Latitude.	Longitude.	Temperature of the Ocean.	Period of the Observation.	Observers.	Mean Temperature of the Air in the Bason of the Sea.
0° 58′ S.	27° 34′ W.	80° 96′ Fahr.	Nov. 1788	Churruca	80° 6′ (Cook)
0 57	30 11	81 86	April, 1803	Quevedo	
0 33	21 20	81 86	March, 1800	Perrins	
0 11 N.	84 15	82 40	Feb. 1803	Humboldt	
0 13	51 42 E.	80 78	May, 1800	Perrins	
25 15 N.	20 36 W.	68 00	June, 1799	Humboldt	69° 8′ (La Perouse and Dalrymple)
25 29	39 54	70 88	April, 1803	Quevedo	
25 49	26 20	69 26	March, 1800	Perrins	
27 40	17 4	70 88	Jan. 1768	Chappe	
28 47	18 17	74 30	Oct. 1788	Churruca	
42 34 N.	15 45 W.	51 98	Feb. 1800	Perrins	54° 86′ (Cook and d'Entrecasteaux)
43 17	31 27	59 90	May, 1803	Quevedo	
43 58	13 7	60 62	June, 1799	Humboldt	
44 58	34 47	54 86	Dec. 1789	Williams	
45 13	4 40	59 90	Nov. 1776	Franklin	
48 11	14 18	57 74	June, 1790	Williams	

These tables refer only to the Atlantic ocean; but the experiments which have been made in the South sea, and in the Indian ocean, show that, within a certain distance of the equator, the general temperature of the sea follows nearly the same rule in corresponding latitudes. Within the tropics there is no sensible difference in north and in south latitudes; there is very little even as far as 35° and 40°; but, when we advance into high latitudes, there can be no doubt that the sea is colder in the southern than in the northern hemisphere. Ice extends from five to eight degrees of latitude farther from the south than from the north pole, owing, it is probable, to the almost entire absence of land near the Antarctic circle; while the north pole is so nearly surrounded by land, that the ice of the Arctic ocean is shut up, and cannot be carried forward to such a distance by the current which sets towards the equator.

Bays, inland seas, and the spaces among clusters of islands, where the action of the waves is more confined, and the water usually of less depth, are the most favourable places for the production and accumulation of the marine ice. It is on this account that the navigation of the Baltic is annually stopped by the ice, in a latitude not more northerly than that of tracts which, in the main ocean, are always open to the passage of ships. In severe winters, people may travel in sledges across the entrance of the Gulf of Bothnia (latitude 60°) which, including the numerous small intervening islands, is a distance of 115 miles. The body of ice accumulated in Lancaster's Sound has defied all the attempts that have been made to accomplish the north-west passage from the Atlantic to the Pacific.

The ice of the polar seas assumes a great variety of shapes and appearances. The vast and thick sheets, which are met in the high latitudes, are called fields by navigators; they are so extensive that their boundaries cannot be seen from a ship's mast-head; and Captain Cook found a chain of them joining Eastern Asia to North America: sheets of less extent than fields are called floes. Bergs are islands of ice, considerably elevated above the water; and, though of the most various forms, commonly perpendicular on one side, and sloping gradually down on the other—in height they are sometimes as much as 200 feet. There are two ways of explaining the formation of these bodies. The large masses of ice in the Polar seas, when crowded together by winds and currents, exert such an enormous pressure upon each other, that they are frequently broken, and the fragments are piled up so as to form mounds and ridges of considerable elevation; it is thus that many of the small icebergs originate. There is no doubt, however, that the most bulky of these bodies are detached portions of vast glaciers, such as abound on the precipitous coasts of Greenland and Spitzbergen, broken off in consequence either of their own weight, or the undermining actions of the waves, and then carried by winds and currents to other parts of the ocean.

When the summer has well advanced the masses of ice, which have been frozen together during the winter, gradually separate, and clear spaces of water are left. As soon as the end of September these open spaces again begin to freeze over; and, before this effect commences, the temperature of the air must be very much lowered, owing partly to the freezing point of sea being 3½° (Fahrenheit) below that of common water, but more especially to the surface which the water presents to the atmosphere being repeatedly changed, before its temperature is sufficiently reduced for it to freeze. This change in the surface, which is greatly assisted by the agitation of the sea, takes place in consequence of the particles of a liquid body becoming specifically heavier as they get cooled, so that they descend and are succeeded by warmer particles.

There are three kinds of movements constantly going on in the waters of the sea:—1. The agitations which its surface undergoes by the action of winds.—2. Tides, which are the result of the attraction exercised on the water by the sun and moon.—3. Currents, which arise from different causes, some of them existing within the element itself. As the particles of a fluid press equally in every direction, it follows that when a portion of the surface of the water is displaced by wind, the adjoining water instantly rushes in to restore the equilibrium or balance which has been destroyed: this accounts for the formation of waves. When a violent impulse has been communicated, the waves continue in motion for some hours after the gale has entirely subsided, on the same principle as a pendulum continues to swing for some time after it has been set in action. Yet the agitation occasioned by winds extends to comparatively but a little way below the surface of the water: divers say that, in the roughest weather, it is calm at the depth of 90 feet.

The subject of this section has been chiefly derived from the works published under the Society for the Diffusion of Useful Knowledge.

SECTION XII.

TABLE OF LATITUDES AND LONGITUDES.

ENGLAND, WALES, AND IRELAND.

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
London, St. Paul's	51°	30′	49″	N	0°	5′	47″	W
Greenwich, Observatory	51	28	39		0	0	0	
Sheerness Flagstaff	51	26	45		0	44	26	E
North Foreland Light	51	22	25		1	26	34	
South Foreland High Light	51	8	26		1	22	6	
Dover Castle	51	7	47		1	19	7	
Dungeness Lighthouse	50	55	1		0	57	48	
Beachy Head Station	50	44	24		0	15	12	
Brighton Church	50	49	32		0	7	40	W
Sea Ower Light-vessel	50	39	57		0	39	59	
Portsmouth Academy	50	48	4		1	5	59	
South-Sea Castle	50	46	44		1	5	2	
Calshot Castle	50	49	7		1	18	6	
Hurst Castle	50	42	25		1	32	45	
Dunnose	50	37	9		1	11	36	
St. Catherine's Tower	50	35	34		1	17	51	
Needle's Lighthouse	50	39	54		1	33	55	
Portland Upper Lighthouse	50	31	23		2	26	49	
Berry Head	50	24	2		3	28	14	
Start Point Flagstaff	50	13	27		3	38	21	
Bolt Head Station	50	13	45		3	48	3	
Eddystone Lighthouse	50	10	54		4	15	3	
Mewstone, near Plymouth Sound	50	18	30		4	5	33	
Plymouth New Church	50	22	21		4	7	16	
Rame Head Flagstaff	50	18	53		4	12	29	
Dodman or Deadman Point	50	13	21		4	47	4	
St. Anthony's Head Flagstaff	50	8	35		4	59	31	
Pendennis Castle	50	8	50		5	1	44	
Lizard Upper Lighthouse	49	57	41		5	11	5	
St. Michael's Mount	50	7	2		5	27	33	
Land's End, Stone	50	4	8		5	41	31	
Longship's Lighthouse	50	4	2		5	43	33	
Scilly Islands, St. Agnes' Light	49	53	37		6	19	23	
St. Agnes' Beacon, Cornwall	50	18	27		5	11	56	
Trevose Head	50	32	57		5	0	54	
Hartland Point	51	1	22		4	30	26	
Lundy Island Lighthouse	51	10	5		4	39	20	

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
Bristol Cathedral	51°	27′	6″	N	2°	35′	29″	W
Worm's Head	51	33	56		4	18	56	
St. Anne's High Light, Milford	51	40	59		5	9	19	
Milford Church	51	42	43		5	0	39	
Small's Lighthouse	51	43	18		5	38	54	
Liverpool, St. Paul's	53	24	40		2	58	55	
DUBLIN Light	53	21	13		6	5	13	
Waterford	52	12	0		7	6	0	
Tuskar Light	52	13	0		6	7	0	
Cork	51	53	54		8	28	0	
Kinsale, Old Head	51	35	0		8	30	0	
Baltimore	51	28	0		9	20	0	
Cape Clear	51	24	55		9	29	0	
Bantry Bay, Sheep's Head	51	31	0		9	52	0	
Skellig, outer	51	50	0		10	27	0	
Dursey Island, W. end	51	34	0		10	15	0	
Brandon Head	52	22	0		10	7	0	
Kerry Head	52	27	0		9	53	0	
Loop Head	52	34	0		9	52	28	
Limerick	52	39	0		8	33	0	

FRANCE, SPAIN, AND PORTUGAL.

PARIS, Observatory	48	50	15	N	2	20	15	E
Calais	50	57	32		1	51	16	
Boulogne	50	43	37		1	36	59	
Dieppe Light	49	55	34		1	4	44	
Havre	49	29	14		0	6	38	
Cape le Heve Lighthouse	49	30	42		0	4	15	
Cape Barfleur Lighthouse	49	41	45		1	16	15	W
Cherbourg	49	38	31		1	37	3	
Cape Frehel Lighthouse	48	41	10		2	18	36	
Ushant Lighthouse	48	28	8		5	3	6	
Brest	48	23	14		4	28	45	
L'Orient	47	45	11		3	21	2	
Belle Isle, S. end	47	17	17		3	4	45	
Nantes	47	13	6		1	32	44	
Rhe or Re Island Lighthouse	46	14	49		1	33	25	
Oleron Tour de Chassiron Light	46	2	51		1	24	12	
La Rochelle	46	9	21		1	9	40	
Rochefort	45	56	10		0	57	34	
Cordouan Lighthouse	45	35	15		1	10	13	
Bordeaux	44	50	14		0	34	0	
Bayonne	43	29	15		1	28	26	
MADRID, Grand Place	40	24	57		3	41	45	
Santander	43	28	20		3	39	50	
Cape Ortegal	43	46	40		7	50	30	
Cape Prior	43	34	15		8	15	45	
Ferrol, entrance	43	28	0		8	16	15	
Corunna Lighthouse	43	23	36		8	19	35	
Cape Finisterre	42	56	10		9	16	15	
Vigo	42	13	20		8	39	45	
Porto or Oporto, entrance to	41	8	45		8	38	0	
Aveiro	40	38	30		8	43	0	

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
Cape Mindego	40°	11′	50″	N	8°	54′	0″	W
Berlengas, or Burlings	39	24	40		9	30	42	
Cape Roca, or Rock of Lisbon	38	46	30		9	30	36	
LISBON, Observatory	38	42	38		9	8	15	
Cape St. Vincent	37	2	54		9	0	54	
Cape Santa Maria, or St. Mary	36	55	24		7	49	50	
Point Chipiona, entrance to St. Lucar	36	44	18		6	24	15	
CADIZ, Observatory	36	32	0		6	17	37	
St. Sebastian Lighthouse	36	31	10		6	18	50	
Cape Trafalgar	36	10	15		6	1	52	
Isle of Tarifa, Lighthouse	36	0	50		5	36	15	
GIBRALTAR, Europa Point	36	6	20		5	20	53	

WESTERN COAST OF AFRICA.

Cape Non	28	41	0	N	11	15	20	W
False Cape Bojador	26	25	12		14	12	30	
Cape Bojador	26	7	10		14	30	30	
Seven Capes, centre	24	41	10		15	0	30	
Angra dos Caballos	20	8	2		15	36	3	
Ouro River, entrance, North Point	23	36	18		15	58	30	
—— Peninsula, South Point	23	36	3		15	58	0	
Cintra Bay, North Point	23	7	0		16	9	2	
————, South Point	22	56	6		16	14	1	
Cape Barbas	22	19	30		16	39	10	
Pedra de Agall	22	12	4		16	47	8	
Cape Corvoeiro	21	13	3		17	4	5	
Cape Blanco	20	47	0		17	4	30	
Cape Mirik	19	25	0		16	34	0	
Portendik	18	19	0		16	2	10	
Senegal River, Island of St. Louis	16	0	8		16	32	0	
——— entrance, North Point,	15	55	3		16	32	7	
Cape Verd, the Paps	14	43	25		17	30	45	
Goree Town	14	39	50		17	25	0	
Portudal	14	27	3		17	3	2	
Joal Town	14	11	0		16	49	5	
Gambia River, Bathurst Flagstaff	13	28	0		16	35	3	
——— Bird Island Flagstaff	13	39	10		16	40	30	
——— Cape St. Mary	13	30	10		16	41	20	
——— Fort James	13	19	7		16	22	2	
——— Tankrowall	13	25	0		16	3	8	
——— Elephant Port, West Point	13	26	5		15	20	6	
——— Yawamarroo Town	13	42	0		14	58	5	
——— McCarthy's Island, Fort George	13	33	0		14	45	5	
——— Pisanya	13	32	9		14	34	3	
San Pedro River	13	10	0		16	45	5	
Sonta River, Bird Island	12	43	5		16	45	0	
Cassamas, or Casamanze River, entrance	12	35	5		16	43	0	
Cape Roxo	22	22	9		16	51	4	
Roussin's Roxo Cape	12	20	5		16	45	8	
Bissao, Portuguese Fort	11	51	0		15	37	1	
Bijuga Islands, Papukawa	11	36	5		15	54	2	
Bijooga Islands, Arcas	11	41	2		15	39	0	

NAMES OF PLACES.	LATITUDE.			LONGITUDE.		
Bijooga, Rio Grande, Bolola Town	11°	35′	0″ N	15°	2′	3″ W
——— Bulama Island	11	34	7	15	30	4
——— Bossessamé, or Tombally { North Point	11	29	0	15	30	0
S. W. Point	11	19	4	15	32	2
——— Gulinha Island, West Point	11	27	7	15	46	5
——— N. E. Hog Island, East Point	11	20	0	15	40	7
——— Kanyabac Island, S. W. Point	11	10	2	15	40	2
Orango Island, Cape Camelion, S. E. Point	11	3	10	15	55	10
——————— West Point	11	6	0	16	15	0
Rio Grande Shoals. { S. Breakers off Orange Isl.	10	56	3	15	57	5
West Breakers	11	31	30	16	56	0
South Breakers	10	42	20	16	18	10
Pullam Islands	10	51	42	15	45	5
Alcatraz Island, centre	10	37	10	15	26	30
Bank, rocky centre	10	30	0	15	10	0
Nunez River, entrance	10	36	0	14	42	20
Cape Verga	10	19	0	14	23	30
Pongas River, entrance South Point	10	7	0	13	58	5
Sangaree, Highest Peak	9	53	0	13	22	0
Isles de Los, Crawford Island	9	27	30	13	48	30
Tamara Island { North Point	9	31	0	13	40	30
West Point	9	26	5	13	51	4
Matacong Island, centre	9	14	0	13	25	30
Parrot Island, centre	8	55	2	13	17	5
Cape Sierra Leone	8	30	0	13	18	30
————— King Tom's Point	8	30	6	13	14	30
————— Free Town Citadel	8	29	42	13	14	20
————— False Cape	8	25	50	13	17	50
Cape Schilling	8	9	30	13	10	10
Banana Islands { Highest Peak	8	5	8	13	16	2
West Point	8	5	0	13	15	2
Plantain Islands, Gillmonis	7	55	12	13	0	10
——— Bengal Rocks, Western	7	54	6	13	2	8
Point Tasso	7	55	30	13	2	10
Turtle Islands, North Island, centre	7	40	48	13	4	20
Cape St. Ann	7	34	0	12	57	0
————— Shoals from { N. extreme	7	56	0	—	—	—
S. extreme	7	31	5	—	—	—
W. limit	7	48	0	13	29	0
Sherbro River, York Island, Huts	7	32	0	13	26	40
————— Sea Bar, South Point	7	22	48	12	31	25
————— Boom Kittam R. Forks of	7	14	4	12	8	6
Cape Mount	6	44	40	11	25	0
St. Paul's River	6	22	0	10	36	5
Cape Mesurada	6	18	30	10	48	30
Cape Palmas	4	24	0	7	46	10
Cape Lahou Town	5	12	0	4	36	0
Cape Three Points	4	45	0	2	4	15
Elmina Castle	5	5	0	1	22	30
Cape Coast Castle	5	6	0	1	13	0
Accarah, English Factory	5	31	5	0	1	0
Volta River, entrance	5	47	18	0	42	18 E
Cape St. Paul's	5	45	0	0	52	18
Benin River, North Point	5	43	0	5	0	0

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
Rio dos Escardos, North West Point	5°	34′	2″	N	5°	12′	0″	E
Rio Forcados, or Warrée, S. W. Point	5	20	5		5	19	4	
Ramos River, entrance	5	5	30		5	23	18	
Cape Formosa	4	21	0		6	5	0	
New Calabar River, Foche Point	4	22	7		7	0	0	
Bonny River, Rough Corner	4	23	7		7	7	0	
Old Calabar River, Tom Shot's Point	4	35	0		8	18	36	
Rio del Rey, West Point	4	28	7		8	40	0	
Cameroon Mountain, highest	4	13	5		9	9	5	
——— River, South East Point	3	49	12		9	32	24	
St. John's Cape, near Corisco Bay ent.	1	10	0		9	18	40	
Corisco Island, centre	0	54	5		9	17	5	
Cape Esterias	0	37	48		9	18	0	
Gaboon River, Cape Clara	0	30	30		9	17	30	
Nazareth River	0	37	12	S	8	57	50	
Cape Lopez	0	36	10		8	40	0	
Mayumba Bay, Metooti Point	3	22	40		10	35	0	
Loango River, entrance	4	39	30		11	42	0	
Congo River, Shark Point	6	4	6		12	12	5	
Cape Lagostas	8	45	1		13	11	7	
Loando Island, North Point	8	46	2		13	9	3	
——— St. Paul de Loando Town	8	48	5		13	8	0	
Cape Palmarinhis	9	7	2		12	56	8	
River Coanza	9	19	5		13	7	0	
Cape Ledo	9	46	0		13	12	0	
Cape St. Bras	10	1	5		13	16	8	
Nova Redonda	11	36	42		13	44	40	
Benguela { St. Phillip's Bonnet	12	34	4		13	14	1	
Fort Flagstaff	12	33	9		13	20	0	
Point Salmas	12	53	0		12	53	12	
Friar's Islets	13	12	3		12	44	2	
Cape Mary, Pillar	13	25	12		13	31	50	
Cape Martha	13	54	10		12	23	30	
Brown's Point, W. of Little Fish Bay ex.	15	13	0		12	2	0	
Cape Negro	15	40	42		11	53	20	
Alexander Port, sand forming do. N. Pt.	15	47	0		11	46	30	
Great Fish Bay, Tiger Island, N. Point	16	30	12		11	41	0	
Cape Frio	18	23	0		11	57	10	
Cape Cross	21	50	0		13	51	48	
Walwich Bay, Pelican Point	22	52	30		14	22	5	
Hollam's Bird Island, centre	24	37	24		14	27	10	
Angra Peguena	26	38	30		15	2	30	
Possession Island, South Point	26	58	30		15	7	30	
Orange River, Dry Bar	28	38	30		16	22	30	
Cape Voltas	28	44	0		16	26	39	
Cape Donkin	31	54	12		18	14	10	
Cape Deseada	32	18	25		18	17	0	
Paternoster Point	32	42	12		17	49	10	
Cape Castle	32	46	8		17	46	5	
Saldanha Bay, North Point	33	1	50		17	48	30	
Point Isser	33	22	18		18	5	40	
Dassen Island, centre	33	26	12		18	1	30	
Point Back	33	33	48		18	14	0	
Cape of Good Hope, Robben Island	33	47	50		18	17	30	

NAMES OF PLACES.		LATITUDE.				LONGITUDE.			
Cape of Good Hope, Observatory		33°	55′	12″	S	18°	23′	35″	E
————	Green Point Lighthouse	33	53	10		18	19	30	
————	Table Mount, Devil's Peak	33	57	12		18	21	30	
————	Cape Town Castle Flagstaff	33	55	2		18	20	8	
————	Cape Point, extreme	34	22	0		18	24	4	
————	Bellows Rock	34	23	48		18	24	30	
False Bay, Simon's Bay	Anvil Rock	34	22	40		18	26	5	
	Dock Yard	34	11	18		18	21	0	
	Whittle Rock	34	16	30		18	29	0	
———— Seal Islands	Southern	34	8	6		18	30	2	
	Shoals	34	9	7		18	31	0	

AZORES, OR WESTERN ISLANDS.

NAMES OF PLACES.		LATITUDE.				LONGITUDE.			
Formigas, or Ants		37	16	50	N	24	54	18	W
St. Mary	Town	36	58	0		25	12	33	
	South East Point	36	56	47		25	6	0	
	South West Point	36	57	31		25	14	18	
St. Michael, West Point		37	54	2		25	55	5	
———— Ponta del Gada	City	37	45	10		25	41	30	
	East Point	37	48	2		25	10	3	
Terceira, Angra		38	39	0		27	14	0	
St. George, South East Point		38	29	22		27	50	42	
Pico, Peak Summit		38	26	15		28	28	13	
Fayal, South East Point, Look-out-hill		38	30	12		28	41	52	
Flores, North Point		39	33	29		31	8	30	
Corvo, South Point		39	41	13		31	3	0	

MADEIRA ISLANDS.

NAMES OF PLACES.		LATITUDE.				LONGITUDE.			
Madeira, Funchal, Loo Rock		32	37	7	N	16	55	5	W
———— Porte del Pargo	W. Point	32	49	0		17	14	30	
	E. Point	32	43	50		16	38	2	
————	Brazen Head, S. E. extreme	32	37	18		16	51	42	
Porto Santo, Governor's House		32	2	9		16	18	8	
Desertas,	North Island	32	36	30		16	33	0	
	South Island	32	28	30		16	31	18	
Salvages, Piton	Eastern Rock	30	3	30		16	2	30	
	Large Islet	30	7	54		15	54	40	

CANARY ISLANDS.

NAMES OF PLACES.		LATITUDE.				LONGITUDE.			
Teneriffe	Santa Cruz, Mole Head	28	28	0	N	16	15	0	W
	Peak	28	16	25		16	39	0	
Allegranza Island		29	25	30		13	31	0	
Lanzarota, East Rock		28	48	0		13	17	7	
Palma,	North Point	28	52	30		17	56	30	
	East Town	28	43	0		17	45	0	
	West Town	28	38	0		17	57	0	
Gomera Island, Port		28	5	40		17	7	0	
Fuerta Ventura, South West Point		28	4	0		14	28	50	
Canaria Island,	N. E. Point Islet	28	13	0		15	24	0	
	West Point	28	1	20		15	50	0	
	South Point	27	45	0		15	37	30	

NAMES OF PLACES.		LATITUDE.				LONGITUDE.			
Ferro,	Town	27°	47′	20″	N	17°	56′	0″	W
	West Point	27	44	0		18	9	0	

CAPE DE VERD ISLANDS.

St. Antonio,	North Point	17	12	0	N	25	9	20	W
	East Point	17	5	30		25	2	40	
	West Point	17	4	0		25	25	45	
————Tarafal Bay,	Station	16	56	48		25	22	30	
	South Point	16	55	0		25	22	0	
St. Vincent, Porto Grande, Custom-House		16	54	0		25	4	0	
St. Lucea,	North Point	16	49	0		24	50	30	
	East Point	16	46	0		24	45	0	
Branca, centre		16	40	0		24	44	0	
Raza, station		16	38	0		24	38	30	
St. Nicholas	North Point	16	42	0		24	24	20	
	West Point	16	38	0		24	30	0	
	Monte Gorda	16	37	50		24	23	50	
	East Point	16	34	30		24	3	0	
	South Point	16	28	30		24	22	0	
Is. of Sal:—Mordeira Bay	Lion's Head	16	41	5		23	0	3	
	N. Point	16	51	20		22	58	30	
	S. Point	16	34	15		23	0	0	
Bonavista:—English Road	Anchorage	16	7	0		22	59	30	
	N.W. Point	16	13	20		22	59	40	
	N. E. Point	16	11	0		22	46	30	
	Martinez H.	16	10	4		22	54	6	
	S. Point	15	57	0		22	52	40	
Leton Rocks		15	48	0		23	13	0	
Mayo:—English Road,	Anchorage	15	7	30		23	17	0	
	North Point	15	19	0		23	16	0	
	South Point	15	6	40		23	14	0	
St. Jago,	North Point	15	19	30		23	49	30	
	East Point	15	0	30		23	29	0	
	South West Point	14	58	30		23	47	0	
Porto Praya, Quail Island		14	53	40		23	34	0	
Fogo, North Point		15	1	15		24	25	0	
Luz Town Anchorage		14	53	0		24	34	0	
Brava, Road		14	48	0		24	47	30	

ISLANDS IN THE GULF OF GUINEA.

FERNANDO PO:—

Maidstone Bay Anchorage	3	45	5	N	8	45	0	E
North East Point	3	45	3		8	53	7	
West Point	3	21	2		8	22	3	
South East Point	3	12	2		8	40	5	
Cape Bullen	3	47	15		8	39	24	
Point William, Flagstaff	3	45	36		8	45	0	
Cape Horatio, North East extremity	3	46	9		8	54	24	
Cape Vidal, East extremity	3	39	18		8	56	20	
Cape Barrow, South Rock	3	11	30		8	40	0	
Cape Eden, South West extremity	3	15	30		8	25	6	
Cape Badgley, West extremity	3	19	42		8	24	40	

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
Charles' Folly, North West extremity...	3°	26′	48″	N	8°	27′	40″	E
Goat Isle, centre	3	31	0		8	32	48	
PRINCE'S ISLAND—The Brothers	1	23	0		7	19	48	
ST. THOMAS'S ISLAND—Cabrita Isle	0	27	0		6	39	48	
Man-of-War Bay, Mansion House	0	27	0		6	44	7	
Man-of-War Bay, Roadstead	0	27	0		6	49	0	
ANNABONA—Road	1	25	0	S	5	42	48	

BERMUDAS.

Wreck Hill, the Western extremity of the Land	32	15	20	N	64	47	0	W
The Long Bar, the South Western extremity of the Rocks	32	9	0		64	54	0	
The South West Breaker	32	10	0		64	45	0	
The Southern extremity of the Land ...	32	13	10		64	46	40	
St. David's Head, the Eastern extremity of the Land	32	21	20		64	35	40	
Catherine Point, the Northern extremity of the Land	32	23	0		64	33	0	
Town of St. George	32	22	20		64	37	40	
North Rock, the Northern extremity of the Rocks	32	29	0		64	42	50	
Mill's Breaker, the Eastern extremity of the Rocks	32	27	0		64	30	0	

GREENLAND, LABRADOR, AND NEWFOUNDLAND.

Cape Farewell	59	49	12	N	43	53	40	W
John Mayen's Isle	71	10	0		9	49	0	
Button's Islands	60	45	0		64	55	0	
Cape Chidley	60	14	0		65	20	0	
Port Manvers	56	58	0		62	0	0	
Nain	56	24	0		61	48	0	
Leveret Islet	53	50	40		56	32	0	
Wolf Island	53	45	0		55	37	0	
Spotted Island	53	30	30		55	26	30	
Round Hill Island	53	25	20		55	21	0	
Hawke Island	53	4	20		55	26	0	
Cape St. Michael	52	47	0		55	27	0	
Cape St. Francis	52	37	0		55	23	30	
Point Spear	52	32	0		55	20	30	
Cape St. Louis	52	25	30		55	20	0	
Cape Charles Island	52	16	40		55	17	0	
Barge Point	51	47	30		56	2	30	
Forteau Point	51	27	0		56	54	0	
Great Mecatina Point	50	44	28		58	59	27	

NEWFOUNDLAND.

Cape Norman	51	37	0	N	55	48	0	W
Cape Bauld	51	38	0		55	30	0	
Needles' Rocks	51	26	5		55	22	45	
Braha Shoal	51	25	40		55	20	0	

NAMES OF PLACES.	LATITUDE.			LONGITUDE.		
Cape St. Antony	51°	21′	0″ N	55°	28′	0″ W
Goose Cape	51	17	0	55	32	0
How Harbour	51	20	0	55	51	0
Fishot Isle	51	12	30	55	34	30
Croque Harbour	51	3	0	55	41	0
Groais Isle	50	59	0	55	27	0
Belle Isle, N. Point	50	48	0	55	23	0
Rouge Island, N. Point	50	54	0	55	42	0
Canada Head	50	41	0	56	2	0
Fourchet Harbour	50	30	0	56	10	0
Orange Bay	50	22	0	56	20	0
Cat Head	50	7	0	56	34	30
Cape St. John	50	10	0	55	28	0
Toulinguet or Twilingate Islands	50	3	0	54	40	0
Fago or Fogo Island	50	0	0	53	54	0
Cape Freels, South Bill	49	18	40	53	24	0
Cape Bonavista	48	42	0	52	56	0
Cape St. Francis	47	48	4	52	43	41
St. John's Church	47	34	30	52	44	0
Cape Spear	47	30	53	52	33	30
Bull Head	47	18	0	52	41	19
Cape Broyle, N. Point	47	3	52	52	47	27
Cape Ballard	46	47	0	52	53	20
Cape Race	46	40	0	52	59	10
Cape Race Rocks	46	30	0	51	30	0
Trepassey Bay	46	43	30	53	16	0
Cape Pine	46	37	14	53	30	0
Cape St. Mary	46	49	25	54	8	45
Point Bream	46	58	0	54	11	0
Cape Chapeau Rouge	46	54	19	55	20	30
St. Peter's Lighthouse	46	46	52	56	8	44
Little Miquelon, S. Point	46	47	0	56	19	0
Burnt Island	47	16	0	56	0	0
Fortune Head	47	9	0	55	51	30
Penguin Islands	47	24	0	57	0	0
Cape Ray	47	37	30	59	17	2
Cape St. George	48	28	54	59	14	26

GULF AND RIVER ST. LAWRENCE.

QUEBEC	46	47	30 N	71	10	0 W
ISLAND OF ANTICOSTI:—						
West Point	49	52	0	64	33	55
North Point	49	57	38	64	11	1
South West Point	49	23	0	63	43	0
South Point	49	4	0	62	18	0
Island of Anticosti, East point	49	8	30	61	42	57
NEW BRUNSWICK, &c.						
Cape Gaspe, S. E. Point	48	45	14	64	9	38
Bonaventure Island, N. W. Point	48	29	30	64	9	37
Point Miscou	48	1	27	64	31	49
Point Escuminac, at the entrance of Miramichi	47	5	2	64	49	30
Cape St. George, formerly Louis	45	51	22	61	51	12

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
The North end of the Gut of Canso	45°	42′	0″	N	61°	26′	0″	W
PRINCE EDWARD ISLAND:—								
East Point	46	27	30		61	56	8	
Charlotte Town	46	16	0		63	10	0	
Cape North	47	4	20		64	0	15	
BRETON ISLAND:—								
Cape North	47	2	13		60	22	53	
Siboux Isles, at the entrance of St. Anne's Bay	46	24	20		60	25	30	
Scatari Island, off Cape Breton	46	1	30		59	40	0	
Louisbourg Old Lighthouse	45	53	31		59	55	48	
Albion Cliff, S. side of Isle Madame	45	28	12		61	1	0	
Ship Harbour in Gut of Canso	45	36	24		61	20	25	
THE MAGDALEN ISLANDS, &c.								
Biron Island, N. E. Point	47	48	0		61	25	0	
Bird's Island	47	50	28		61	11	53	
Entry Island, S. W. point	47	16	7		61	43	26	
St. Paul's Island	47	13	38		60	11	24	

NOVA SCOTIA AND BAY OF FUNDY.

ISLE OF SABLE:—								
East end	43	59	15	N	60	2	30	W
West end	43	56	30		60	31	0	
Crow Harbour, Chedabucto Bay	45	20	45		61	15	20	
Cranberry Island Light	45	19	33		60	54	38	
Cape Canso	45	16	30		60	56	0	
Raspberry Harbour, Point Gell	45	13	30		61	3	15	
Berry Head, West Side, Torbay	45	10	44		61	17	9	
Cape Mocodome, Country Harbour	45	5	20		61	40	28	
S. W. Point Liscombe Harbour	44	57	0		61	55	0	
Mariet Joseph	44	56	40		62	2	0	
Cape Spry	44	48	25		62	33	15	
Jedore Head	44	40	5		63	1	10	
Halifax, Naval Yard	44	39	26		63	33	48	
Cape Sambro Lighthouse	44	27	0		63	33	0	
Holderness Island, Margaret's Bay, South West side	44	34	25		63	55	30	
Green Island, Mahone Bay	44	23	30		64	1	0	
Cross Island, S. Point, off Lunenberg Harbour	44	19	30		64	8	45	
Cape Le Heve	44	11	8		64	19	43	
Port Metway, S. W. Head	44	6	24		64	31	9	
Coffin's Island, Lighthouse	44	1	52		64	36	49	
Mouton, or Matoon Island, S. Point	43	55	0		64	44	0	
Point Hebert	43	51	10		64	51	20	
Shelburne, or Cape Roseway Lighthouse	43	37	30		65	14	40	
Cape Negro	43	31	0		65	17	30	
Cape Sable	43	23	57		65	34	3	
Brasil Rock	43	21	30		65	22	0	
Seal Island, South Point	43	23	51		65	55	42	
Cape Fourchu, near Yarmouth	43	48	0		66	9	0	
Cape St. Mary	44	4	15		66	11	0	
Bryer's Island, Lighthouse	44	13	51		66	22	54	

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
Annapolis, Lighthouse	44°	40′	25″	N	65°	46′	15″	W
Cape Split, Mines Channel	45	17	30		64	22	0	
Cape Chignecto	45	18	0		64	49	30	
Apple River, entrance	45	27	0		64	43	0	
Cumberland, Fort	45	44	0		64	9	0	
St. John's, New Brunswick, Point Maspeck, on the East side	45	12	30		65	59	15	

THE UNITED STATES.

Mount Desert Rock	43	51	0	N	68	6	0	W
Isleboro', or Long Island, in the Bay of Penobscot, a Point on the E. side	44	15	0		68	45	0	
White Head, Lighthouse	43	59	0		68	58	15	
Portland Lighthouse	43	36	30		70	10	0	
Cape Elizabeth	43	33	0		70	11	0	
Cashe's Ledge, 12 feet water	43	2	0		69	6	0	
Boon Island Lighthouse	43	8	0		70	29	0	
Portsmouth, Light	43	3	30		70	42	0	
Newbury Port Lights	42	47	45		70	48	30	
Cape Anne, Lights	42	39	0		70	34	0	
Boston, Beacon Hill	42	22	35		70	59	35	
Boston Harbour Lighthouse	42	20	0		70	58	30	
Cambridge	42	23	28		71	4	0	
Cape Cod High Lighthouse	42	3	0		70	4	0	
Providence	41	50	40		71	25	20	
Long Island Lighthouse	42	20	0		71	55	40	
Five Islands Inlet Lighthouse	40	35	0		73	40	0	
NEW YORK, Colombia College	40	42	20		74	3	31	
Sandy Hook Lighthouse	40	27	40		74	2	0	
Cape May Lighthouse	38	57	0		74	55	45	
Cape Henlopen Lighthouse	38	46	30		75	7	0	
PHILADELPHIA	39	56	54		75	10	30	
Cape Henry Lighthouse	36	56	0		76	0	0	
WASHINGTON	38	52	45		77	0	30	
Cape Hatteras Lighthouse	35	15	0		75	30	0	
Cape Fear Lighthouse	33	51	15		78	1	40	
Frying Pan, or Cape Fear Shoals, S. end	33	36	0		77	50	0	
George Town Lighthouse	33	10	0		79	2	40	
Cape Roman Light	33	0	0		79	17	0	
Charleston Lighthouse	32	40	49		79	46	30	
Savanna, Tybee Lighthouse	32	0	0		80	51	0	
Cumberland Island Lighthouse	30	45	0		81	38	30	
River Nassau, entrance	30	28	0		81	33	0	
River St. Juan, or St. John	30	21	0		81	32	30	
St. Augustin Light	29	54	0		81	25	30	
Matanza Inlet	29	42	0		81	19	30	
Cape Canaveral	28	17	0		80	25	0	
Cape Florida	25	46	0		80	4	0	
Sable Point, or Punta Tancha	25	1	0		81	10	0	
Dry Tortugas Lighthouse	24	36	0		83	0	0	
Tortugas Bank, Shoalest part	24	31	0		83	14	0	
Bar of Pensacola	30	18	0		87	33	0	
Bar of Mobile	30	10	0		88	10	0	

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
Mississippi, Balise, or S. E. entrance ...	29°	7′	30″	N	89°	10′	0″	W
NEW ORLEANS	29	57	30		90	6	17	

THE WEST INDIES.

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
LITTLE BAHAMA BANK :—								
Maternillo Bank, North end of...........	27	51	0	N	79	10	0	W
Maternillo Reef, North West end.........	27	34	0		79	9	0	
Outer part of the Western Reef...........	27	5	0		79	12	0	
Memory Rock.................	26	55	0		79	2	0	
West end of Grand Bahama	26	41	0		79	1	0	
South East Point of Grand Bahama......	26	28	0		78	40	0	
Hole in the Rock or Wall	25	50	0		77	7	0	
North East Point of Great Abaco.........	26	19	0		76	55	0	
Elbow Reef, Outer Point	26	33	0		76	51	0	
GREAT BAHAMA BANK :—								
Eleuthera, South East Point...............	24	38	0		76	9	0	
———, Governor's Harbour............	25	12	0		76	12	0	
Harbour Island, North Point	25	30	0		76	36	0	
Egg Island Reef, extremity	25	33	45		76	55	30	
Douglas Passage, entrance.................	25	8	30		77	5	45	
New Providence, Nassau Lighthouse ...	25	5	0		77	22	15	
Berry Islands, Frozen Kay	25	32	0		77	35	30	
Great Stirrup Kay, N. E. end	25	50	0		77	53	0	
Great Isaac, centre of.......................	26	2	30		79	3	0	
Bemini Isles, Mosselle Reef	25	50	0		79	15	0	
Riding Rocks	25	11	0		79	8	0	
Orange Kays, middle.......................	24	55	30		79	7	0	
Roquillos, or Little Rocks..................	24	52	0		79	6	0	
Guincho, or Ginger Kay	22	47	0		77	57	0	
Lobos, or Seals' Kay	22	24	0		77	29	0	
Mucaras, or Diamond Point	22	9	0		77	12	0	
Kay of St. Domingo	21	43	0		75	45	0	
Kayo Verde, East end	22	1	0		75	10	30	
THE JUMENTOS :—								
Brothers' Rocks	22	1	0		75	40	0	
Kay Sal, or Ragged Island	22	11	30		75	41	0	
Man-of-War Kay, North end	22	17	20		75	48	40	
YUMA, OR LONG ISLAND :—								
South Point....................................	22	51	0		74	52	0	
Great Harbour, entrance	23	6	0		75	2	30	
Michael Bank, 12 fathoms..................	23	9	15		74	45	30	
North end	23	30	37		75	20	0	
PASSAGE ISLANDS :—								
Little St. Salvador, N. W. Point	24	34	38		75	51	0	
St. Salvador, Columbus, or S. E. Point...	24	8	0		75	17	30	
——— Hawk's Nest, or S. W. Point	24	10	0		75	33	0	
Conception Island, South end.............	23	48	46		75	6	0	
Southampton Reef, N. end..................	23	56	0		75	7	0	
Rum Kay, South East White Cliffs	23	38	40		74	47	20	
Watling's Island, North end	24	10	30		74	28	30	
South West Point	23	56	0		74	34	0	
SAMANA, OR ATWOOD'S KAYS :—								
Eastern Point	23	5	10		73	48	0	

NAMES OF PLACES.	LATITUDE.			LONGITUDE.		
Southern Reef	23°	1′	45″ N	73°	51′	0″ W
Plana, or Flat Kay	22	35	10	73	37	0
CROOKED ISLAND:—						
Extremity of the North East Reef	22	43	0	73	47	0
North East Point of Crooked Island	22	44	30	73	54	20
Bird Rock, off North West Point	22	51	0	74	22	15
Fortune Isle, South Point	22	33	0	74	23	0
Castle Isle	22	7	30	74	18	45
MIRAPORVOS:—						
North Rock	22	7	50	74	31	40
South Kay, Sand Hills	22	5	0	74	31	15
Shoal, South East end	21	58	30	74	28	30
Diana, or Monkey Bank	22	31	30	74	46	0
Mariguana Island, S. W. Point	22	21	30	73	14	0
Eastern end of East Reef	22	17	0	72	38	0
The Hogsties, West Point	21	41	0	73	51	0
GREAT INAGUA, OR HENEAGUA:—						
North West Point	21	8	0	73	40	0
South West Point	20	55	0	73	38	30
South East Point	20	58	0	73	9	0
LITTLE INAGUA, OR HENEAGUA:—						
East Point	21	28	30	72	55	30
West Point	21	30	0	73	5	0
THE CAYCOS:—						
Northern end of the Reef	21	59	0	71	57	0
Little Caycos, South West Point	21	37	0	72	28	0
Southern Kays, West end	21	10	0	71	51	0
South East Elbow of the Bank	21	1	0	71	32	0
Cape Comet	21	45	0	71	26	0
TURK'S ISLANDS:—						
Sand Kay	21	11	0	71	13	0
Salt Kay	21	18	0	71	8	0
Grand Kay, Roadstead	21	28	10	71	7	0
Square Handkerchief, S. W. corner	20	53	0	70	55	40
————————, N. E. corner	21	6	0	70	26	0
SILVER KAY, OR PLATE BANK:—						
West end	20	30	30	69	59	0
South East end	20	13	50	69	35	0
North East end	20	33	0	69	18	0

CUBA AND JAMAICA.

Cape de Cruz	19	47	16 N	77	40	30 W
Peak of Tarquino	19	52	57	76	45	30
St Jago de Cuba, entrance	19	57	29	76	2	45
Port Guantanamo	19	54	5	75	14	30
Cape Maysi, or Maize	20	13	30	74	1	0
Port de Navas, entrance	20	29	44	74	27	52
Port de Jaragua, entrance	20	32	44	74	36	30
Point Guarico	20	39	0	74	41	0
Port de Nipe, entrance	20	44	40	75	29	0
Point Mulas	21	7	30	75	35	0
Cayo Verde, East end	22	0	0	75	13	30
Cayo de St. Domingo	21	45	0	74	44	0

NAMES OF PLACES.	LATITUDE.			LONGITUDE.		
Cayo de Lobos, or Seal Kay	22°	24′	0″ N	77°	29′	0″ W
Cayo de Guincho, or Ginger Kay	22	47	0	77	56	10
Porto de Naranjo, entrance	21	5	23	75	53	10
Port de Jurura, entrance	21	3	39	76	2	30
Port del Padre, entrance	21	15	40	76	26	30
Port de Munati	21	23	44	76	44	0
Point Maternillos	21	39	0	76	59	30
Cayo Romano, South East Point	21	53	0	77	36	0
Cayo Verde, or Green Kay	22	5	6	77	36	15
Double-headed Shot, N. W. Kay	23	57	0	80	21	0
Cayo de Sal, or Salt Kay	23	39	8	80	10	0
Cayo Cruz del Padre	23	14	0	80	56	30
Pan of Matanzas	23	1	39	81	34	30
HAVANNA, Lighthouse	23	8	18	82	22	4
Bahia Honda	22	58	49	83	6	40
Cape Antonio	21	54	0	84	57	30
Cape Corrientes	21	48	0	84	29	20
Point Piedras	21	56	30	83	50	0
Cayo de St. Felipe, West end	21	59	0	83	33	0
Indian Kays, North end	21	54	30	83	15	0
Point Indus, Isle of Pines	21	49	0	83	4	0
Punta Francis	21	42	0	83	9	0
Cape Pepe, Isle of Pines	21	28	0	83	0	0
Isle of Pines, South East Point	21	23	30	82	27	0
Bahia de Jagua, or Xagua	22	1	0	80	35	37
Cayo Blanco	21	33	45	79	58	30
Cayo Blanco de Zarxa	21	31	40	79	44	15
Cayo Breton, South Point	21	3	10	79	32	42
Boca Grande, entrance	20	57	30	79	23	0
Grand Cayman, East end	19	18	30	81	5	0
———— South West Kay, or Point	19	15	0	81	29	0
JAMAICA AND ISLES ADJACENT:—						
Morant Kays, North East Kay	17	26	30	75	54	0
———— South West Kay	17	23	45	75	56	0
Morant, or East Point of Jamaica	17	58	0	76	6	0
South East, or Folly Point	17	56	30	76	5	0
Yallah's Point	17	52	0	76	28	0
Port Royal	17	55	7	76	49	0
KINGSTON, Church	17	57	57	76	46	10
Portland Point	17	42	30	77	7	30
Pedro Bluff	17	50	30	77	49	0
Black River	18	1	10	77	56	0
John's Point	18	11	30	78	22	0
North Negril	18	24	0	78	30	0
South Negril	18	15	45	78	32	0
Montego Bay Point	18	32	30	78	2	30
Galina Point	18	29	30	76	54	0
North East End or Point	18	12	0	76	16	30
Formigas, North East Point	18	34	30	75	38	0
————, South East Point	18	28	30	75	40	0
————, South West Point	18	28	0	75	48	0
Navaza, centre	18	23	15	75	6	0
SHOALS SOUTHWARD OF JAMAICA:—						
Portland Rock	17	7	30	77	26	0

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
Baxo Nueva, or New Shoal, Sandy Kay	15°	52′	20″	N	78°	37′	58″	W
Serranilla, East part	15	45	20		79	50	15	

HAYTI, OR ST. DOMINGO, PORTO RICO, &c.

Isle of Mona	18	6	0	N	67	49	0	W
Isle of Sama, South East Point	18	12	0		61	31	30	
Isle of Santa Catalina, West Point	18	19	0		69	1	0	
St. Domingo	18	28	40		69	59	37	
Punta de Salinas	18	12	40		70	49	30	
Alto-vela, or Little Mount	17	28	11		71	40	30	
Cape Jaquemel	18	11	20		72	33	30	
Aquin Bay	18	13	28		73	20	0	
St. Louis, the Old Fort	18	14	27		73	31	30	
Les Cayes, the Town	18	11	10		73	44	0	
Isle a Vache	18	4	0		73	31	30	
Point a Gravois	18	1	0		73	55	0	
Cape Tiburon	18	19	25		74	27	32	
Point des Iros	18	22	23		74	30	30	
Cape Dame Marie, or Donna Maria	18	37	25		74	25	0	
Point Jeremie	18	39	58		74	6	0	
Pirogues (Rochelois Reef)	18	37	20		73	12	0	
Isle of Gonave, North East Point	18	48	35		72	49	47	
Port au Prince (Road)	18	33	42		72	23	45	
Arcadians, Southernmost	18	45	0		72	38	30	
Point St. Mark's	19	2	18		72	50	0	
Port a Piment	19	35	0		72	57	3	
St. Nicolas Mole Point	19	49	20		73	27	30	
Port Paix, Carenage Point	19	56	0		72	43	0	
Tortuga Island, West Point	20	5	20		72	54	56	
———, East Point	20	3	30		72	34	10	
Cape Haytien, City	19	46	20		72	14	0	
The Grange Point	19	54	35		71	43	10	
Point Isabella	19	58	45		71	12	0	
Old Cape Francois	19	40	30		69	56	30	
Cape Cabron	19	22	0		69	12	50	
Cape Samana	19	15	40		69	6	15	
Cape Enganno	18	34	30		68	20	30	
Point Espada	18	19	48		68	30	0	
Porto Rico:—								
Cape St. Juan, North East Point	18	24	20		65	39	0	
Point Bruquin, or North West Point	18	31	18		67	7	0	
Isle Desecho, or Zacheo	18	23	48		67	27	30	
Aguadilla, Town	18	25	10		67	7	17	
Point Algarroba	18	14	0		67	7	30	
Puerto Guanica, East Point	17	57	44		66	52	45	
Caxa de Muertos, or Coffin, S. W. Point	17	50	30		66	35	0	

CARIBEE AND VIRGIN ISLANDS.

Anegada, South East Point	18	43	48	N	64	16	30	W
———, North West Point	18	46	0		64	26	0	
Virgin Gorda, East Point	18	31	7		64	21	30	
St. John's, South East Point	18	19	0		64	44	20	

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
St. Thomas's (Harbour)	18°	21′	16″	N	65°	0′	0″	W
St. Croix, or Santa Crux, Christianstad	17	44	8		64	43	30	
Sombrero	18	38	0		63	29	30	
Anguilla, S. W. Point	18	11	0		63	16	0	
St. Martin's, North East Point	18	16	0		63	12	30	
Saba	17	39	20		63	19	0	
St. Bartholomew, East Point	17	54	0		62	52	0	
St. Eustatius (Road)	17	29	30		63	4	30	
St. Christopher's, Basse Terre	17	19	30		62	49	30	
Nevis, Charles Town	17	10	30		62	43	0	
Redonda	16	55	30		62	26	0	
Monserrat, North East Point	16	48	0		62	16	40	
Antigua, St. John's Road	17	9	40		61	56	30	
Desirade, or Deseada, N. E. Point	16	20	0		61	6	30	
Guadaloupe, Basse Terre	15	59	30		61	47	30	
————, South East Point	16	11	0		61	15	0	
————, North East Point	16	30	0		61	32	0	
Marie-galante, Basse Terre	15	52	15		61	22	0	
The Saintes Western, S. W. Point	15	51	20		61	44	0	
Dominica, Road of Roseau	15	18	23		61	28	0	
————, Prince Rupert's Bay	15	35	30		61	33	0	
Martinique, Fort Royal	14	35	55		61	7	30	
————, Cape Salinas	14	23	50		60	56	10	
St. Lucia, Port Moulacique, or S. Point	13	35	0		61	2	0	
————, Carenage	13	57	0		61	7	0	
St. Vincent, Kingston	13	9	0		61	15	0	
Barbadoes, Bridgetown	13	5	30		59	43	15	
Grenada, Fort St. George	12	2	54		61	49	40	
Tobago, Man-of-War Bay	11	22	0		60	32	0	
————, North East Point	11	23	0		60	27	0	
————, South West Point	11	9	0		60	52	0	
Trinidad :—Galera, or N. E. Point	10	50	20		60	56	35	
Point de la Galeota, or S. W. Point	10	9	30		61	0	50	

LEEWARD ISLANDS.

Boca de Navois, or Ship Channel	10	41	45	N	61	48	0	W
Port au Spain	10	38	45		61	34	15	
Testigos Islands, N. E. Point	11	24	30		63	9	30	
Margarita Pampatar	10	59	15		63	53	30	
————, North Point	11	10	30		63	58	30	
————, Point de Arenas or Sandy Point	10	59	0		64	29	30	
Blanquilla, North Point	11	54	30		64	41	50	
Tortuga, S. E. Point	10	55	0		65	16	50	
Orchilla, North East Breakers	11	49	0		66	9	30	
Shoal of Two Fathoms	12	9	15		66	9	20	
Los Roques, or Roccas, N. E. Islet	11	58	40		66	42	20	
ISLAS DE AVES (BIRD'S ISLANDS):—								
Windward Isle	11	57	30		67	31	20	
Leeward Isle	11	59	30		67	45	35	
Buen-ayre, North Point	12	19	15		68	30	0	
Curazao, North Point	12	24	0		69	16	20	
Bay of St. Anne, entrance	12	6	20		68	3	0	
Little Curazao, North End	12	0	0		69	44	30	

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
Oruba, the South East Point	12°	23′	45″	N	70°	0′	0″	W

COLOMBIA, MEXICO, &c.

Cape North	1	51	0	N	50	9	0	W
St. Louis Oyapok Fort	3	57	0		51	41	0	
Cayenne Flagstaff	4	56	19		52	14	45	
Brams Point, Surinam	5	56	0		55	15	0	
Paramaribo	5	47	30		55	13	30	
Corobana Point, Demerary	6	48	0		58	1	35	
Boca de Guayma	8	25	0		59	52	0	
River Orinoco, Point Barima	8	44	30		60	3	0	
Cape Three Points	10	45	15		62	46	0	
Cape Malapasqua	10	42	50		63	6	35	
Cumana	10	27	37		64	15	15	
Isle Borracha, North East Point	10	19	30		64	49	20	
Barcelona	10	13	15		64	48	20	
Piritu Isles, centre	10	9	0		65	1	35	
Isle Unare, centre	10	5	30		65	21	15	
Cape Codera	10	35	54		66	11	30	
Point Chuspa	10	39	30		66	25	30	
La Guayra Road	10	37	0		67	1	35	
City Caracas (St. Jago de Leon)	10	30	0		67	0	55	
Puerto de Turiamo	10	29	10		67	57	20	
Puerto Cabello	10	29	45		68	7	35	
Punta de St. Juan	11	9	0		68	31	35	
Punta del Manzanillo	11	31	15		69	24	5	
Cape St. Roman	12	11	0		70	8	35	
Punta de la Macolla	12	5	0		70	21	20	
Santa Anna de Cora	11	24	0		69	49	50	
Fort or Castle of Zapara	10	58	30		72	31	30	
Maracaybo	10	39	0		71	45	0	
Punta de Espada	12	4	0		71	11	50	
Bahia Honda	12	20	0		71	50	35	
Cape La Vela	12	11	0		72	15	35	
Rio de La Hacha, Town	11	33	30		72	58	55	
Cape St. Augustin	11	16	0		73	40	5	
Cape de la Aguja	11	18	30		74	16	20	
Santa Marta	11	15	0		74	17	35	
Rio Magdalena, Boca de Ceniza	11	5	20		74	56	20	
Punta de Savanilla	11	2	0		75	3	0	
Cascabel Rock	10	55	10		75	7	45	
Palmarito Shoal	10	51	45		75	19	0	
Punta de la Galera	10	47	0		75	29	5	
Cartagena	10	26	0		75	37	5	
Salmedina Bank (Two Fathoms)	10	23	0		75	44	35	
Boca Chica, entrance	10	19	30		75	40	7	
Islas del Rosario, larger	10	11	0		75	49	35	
Puerto de Aspata, entrance	9	25	0		75	51	55	
Isla Fuerte	9	23	30		76	15	5	
Punta Arenas, Gulf of Darien	8	33	0		77	0	5	
Cape Tiburon	8	41	15		77	26	35	
Puerto Carreto	8	47	15		77	38	35	
Punta St. Blas, East Point	9	34	36		79	2	5	

NAMES OF PLACES.	LATITUDE.				LONGITUDE.			
Punta del Manzanillo	9°	39′	30″	N	79°	36′	50″	W
Puerto Velo, or Porto Bello	9	34	29		79	43	40	
Chagres	9	21	0		80	4	5	
Roncador, North end of the Reef	13	35	7		80	3	3	
Serranilla, East side	15	45	20		79	51	15	
Cape Gracias a Dios	14	55	0		82	45	0	
Cape Camaron	16	2	0		85	14	0	
Truxillo	15	54	0		86	2	0	
Swan Islands, North East extremity	17	26	0		83	41	0	
————, South West extremity	17	17	0		83	45	0	
Albion Bank, East North East end	18	55	0		83	9	0	
————, West South West end	18	53	0		83	16	0	
Guanaja, or Bonacca, North East Point	16	31	20		85	55	30	
Ruatan, South West Point	16	16	0		86	51	0	
Half-moon Kay, on the Eastern Reef Lighthouse	17	12	45		87	33	0	
Kay Bokel	17	9	40		87	56	0	
English Kay	17	20	0		88	2	30	
Glover's Reef, North East end	16	53	30		87	35	0	
Balize, Fort George	17	29	29		88	11	15	
Cozumel, North end	20	39	0		86	44	0	
Punta Brava	21	0	0		86	44	0	
Cape Catoche	21	34	0		86	57	30	
Campeche, Town	19	51	0		90	30	0	
Javinal Point	19	12	30		90	56	30	
Punta de Xicalango	18	41	30		91	54	0	
Barra de St. Pedro	18	40	0		92	29	30	
Barra de Tabasco	18	34	16		92	39	13	
Rio Tupilco, entrance	18	25	0		93	25	0	
La Barilla	18	9	0		94	35	0	
Punta de St. Juan	18	18	0		94	38	0	
Barra de Alvarado	18	46	0		95	43	0	
Vera Cruz, Lighthouse	19	12	15		96	7	12	
Xalapa	19	30	8		96	8	0	
Peak of Orizaba, or Orizava	19	2	17		97	12	15	
Puebla de los Angeles	19	0	15		98	2	45	
MEXICO	19	25	45		99	5	30	
Cape Roxo	21	35	0		97	23	0	
Barra de Tampico	22	15	56		97	52	0	
Barra de Santander	23	46	0		97	58	0	
Boquillas Cerradas	25	0	0		97	40	0	
Rio Brava del Norte	25	55	0		97	24	0	
Bar of St. Bernardo	28	55	0		95	48	0	
Galveston Bay, entrance of Bar	29	10	0		96	1	0	

COAST OF BRAZIL.

CAPE SAN ROQUE TO MARANHAM ISLAND:—

CAPE SAN ROQUE, the summit of the cliff	5	28	17	S	35	17	12	W
Point Petetinga, the base	5	21	35		35	19	23	
Point Toiro or Calcanhar, the N. E. extremity of Brazil, summit	5	8	20		35	30	33	
Lavandeira Breaker	4	54	40		36	2	8	
Breakers on the Urcas	4	51	32		36	36	28	

NAMES OF PLACES.	LATITUDE.			LONGITUDE.		
Point Tubaraó, North Down	5°	1′	49″ S	36°	28′	3″ W
Point do Mel	4	55	17	36	59	8
Morro Tibaó	4	49	20	37	17	43
Reteiro Pequeno, remarkable hummock	4	48	16	37	9	5
Reteiro Grande, hummock on the point	4	36	20	37	32	48
Morro of Aracati *(an inland hill)*	3	42	10	37	54	3
Mouth of Jaguaripe	4	23	30	37	49	2
Point Macoripe	3	41	50	38	30	44
Hills of Ciara or Seara, as seen on the Meridian, 1st summit	3	39	27	38	48	8
Curú, the village	3	30	0	38	53	2
Morro, or Mount Melançias	3	11	40	39	19	24
Pernambuquinho	3	1	50	39	37	21
Rio dos Patos, the entrance	2	58	50	39	39	56
Point of Jericoácoarà, highest land	2	47	28	40	27	18
Rio Camucim, or Camosin, Hummock at the entrance	2	50	0	40	44	58
Rio Tapuya, entrance	2	50	25	40	50	13
Rio Iguarassu, entrance, East Point	2	52	27	41	18	5
Rio das Perguicas, or Perjuizas, Eastern Point	2	41	27	42	27	4
Lancoes Grandes, Eastern Point	2	26	12	42	59	54
Morro Alegre	2	20	17	43	13	7
St. Anna's Breakers, Eastern Point	2	12	38	43	29	32
St. Anna's Lighthouse	2	16	18	43	41	22
Breakers of the Coroa Grande :—						
Middle of the Northern	2	10	50	43	57	34
——— N. W.	2	13	15	44	3	59
——— West	2	17	0	44	5	9
Maranham Island, white down on the North side	2	24	36	44	4	11
Fort St. Marcos, Flagstaff	2	28	22	44	15	56
Fort St. Antonio dos Areias, Flagstaff	2	29	24	44	16	49
St. Luis de Maranham, Steeple of the Cathedral	2	30	44	44	16	2
CAPE SAN ROQUE TO BUENOS AYRES.						
Cape San Roque, summit of the cliff,	5	28	17	35	17	12
Forte of Rio Grande do Norte	5	45	0	35	14	32
Point Negra, extremity	5	52	52	35	7	40
Point Pipa	6	12	53	35	3	42
Rio Cunhaó, entrance, South side	6	17	10	35	3	25
Bahia Formosa, South Point	6	23	12	35	0	12
Bahia Traicaó, North Point	6	41	15	34	57	23
Poina Lucena	6	53	35	34	50	28
Fort Cabedello	6	57	30	34	49	50
Paranahyba do Norte, Steeple	7	6	3	34	52	58
Cape Branco, Cliff	7	8	22	34	47	58
Rio Grande de Goyana, entrance	7	30	40	34	46	30
Rio Ay, Fort at the entrance	7	47	13	34	50	28
Nossa Senhorra Farinha	7	56	43	34	50	28
Olinda, Western tower	8	0	59	34	50	40
PERNAMBUCO, Fort Picao	8	3	30	34	51	42
———, Tower of Recife	8	4	7	34	52	37
———, Tower of Boa-Vista	8	3	36	34	52	56

NAMES OF PLACES.	LATITUDE.			LONGITUDE.		
Nossa Senhora do Rosario	8°	9′	18″ S	34°	55′	44″ W
CAPE ST. AUGUSTIN	8	20	41	34	56	34
Mount Sellada	8	25	19	35	10	56
Isles of San Aleixo	8	35	49	35	0	38
Rio Formosa	8	39	40	35	4	34
Fort of Tamandare	8	43	24	35	4	52
Village of Quinta	9	16	18	35	22	37
Porto Franceses, the Point	9	39	45	35	41	11
Rio San Francisco, North Point	10	28	15	36	22	40
——————, South Point	10	28	50	36	23	13
Mountains of Itabayanna, summit	10	47	10	37	23	10
Os Tres Irmaos, or the Three Brothers	11	15	37	37	15	0
Rio Real, South Point	11	28	4	37	17	50
Tower of Garcia da Vila	12	32	26	37	58	35
Rio Jacuipe, entrance	12	41	52	38	6	15
Itapuan, the Signal mast	12	57	3	38	20	0
Rock of Itapuan	12	57	58	38	21	0
Itapuanzinho, the Point	13	0	59	38	27	0
BAHIA, the Lighthouse	13	0	45	38	30	44
Morro of St. Amaro, in Itaporica	13	1	8	38	44	15
Point Jabuua, in Itaporica	12	57	36	38	34	40
Nossa Senhora da Penha	12	59	16	38	35	14
Isle Boypeda, one of the summits	13	37	43	38	53	35
Isle Quiepé	13	50	58	38	55	0
Villa de Contas	14	18	6	38	56	32
Os Ilheos, the largest rock	14	47	23	38	55	0
Town of San Jorge dos Ilheos	14	49	25	38	56	15
Village of Unha	14	59	7	38	53	30
Morro of Commandatuba, the S. E. summit	15	22	8	39	3	33
Village of Commandatuba	15	25	20	38	52	22
Santa Cruz, the Steeple	16	18	50	38	58	0
Monte Pascoal, or Mount Pascal, the summit	16	54	8	39	23	25
Mouth of the Rio Cramimuan	16	51	12	39	10	30
Colombiana	17	6	1	39	7	50
Villa Prado, Flagstaff on the Fort	17	21	28	39	7	30
Paracel dos Paredos, N. E. Point	17	56	45	38	47	30
ABROLHOS ISLES, North-easternmost Rock	17	57	27	38	35	50
——————, Largest Isle, Eastern summit	17	57	44	38	35	54
Rio Doce, West Point of the entrance	19	36	57	39	45	30
Cape Tubaraó, S. W. Point	20	16	22	40	11	0
VICTORIA, Piton to the North of the Town	20	17	49	40	16	40
Dangerous Rock in the Bay of Espirito Santo	20	18	32	40	11	28
Pacotes Rocks, the largest	20	21	2	40	10	15
Isle Jicu, the summit	20	23	9	40	12	30
Point Jicu, the summit	20	26	1	40	14	30
Ilhas Razos (Low Isles) the middle	20	42	42	40	16	15
Isle Calvada, the middle	20	44	8	40	19	30
Guarapari, Steeple on the S. Point of the Bay	20	43	56	40	25	15

NAMES OF PLACES.	LATITUDE.			LONGITUDE.		
Morro of Benevento	20°	55′	21″ S	40°	41′	38″ W
Serro do Pico, highest part	21	1	30	41	13	0
Mount Campos	21	22	38	41	21	56
St. Anna's Isles, the largest	22	25	0	41	40	0
Morro of San Joao, summit	22	32	26	41	59	6
Cape Busios, extremity	22	46	3	41	49	30
Cape Frio, Northern summit	22	59	55	41	56	30
———, Southern Point	23	1	18	41	57	30
Cape Negro, the Point	22	57	10	42	37	30
Maricas, Southern Isle	23	0	53	42	53	0
Redonda or Round Isle, summit	23	4	45	43	6	48
Nossa Senhora da Gloria, the Steeple	22	54	42	43	6	35
Rio Janeiro, Sugar-loaf (1,292 ft.)	22	57	14	43	4	55
————, Vilganhon Flagstaff	22	54	31	43	5	37
————, Isle Ratos or Rat Isle	22	53	16	43	6	20
————, Morro Corcovado, summit	22	56	13	43	9	30
La Gabia, or Gavia	22	59	0	43	13	0
Lage de Marambaya, a flat rock	23	7	47	43	48	40
Morro of Marambaya, summit (700 ft.)	23	5	9	43	59	41
Isle of Jorge Grego, S. W. Point	23	15	11	44	10	49
Point Joatinga, summit of the islet	23	18	30	44	30	10
Isles Couves, the largest	23	25	54	44	49	1
Ponta Grossa	23	28	15	44	58	27
Isle Vittoria, the summit	23	47	42	45	44	57
Busios Isles, the S. E. Isle	23	44	27	44	57	11
Ilhas dos Porcos, Southern hillock	23	33	38	45	1	26
Islet Mar-Virado, summit	23	34	7	45	5	27
Ponta das Ostres, extremity	23	34	52	45	8	31
Villa Bella de Princesa, Roadstead	23	47	26	45	18	30
Point Pirasomungo, on St. Sebastian's	23	57	32	45	11	40
Point Seputuba, on the same	22	56	3	45	20	55
Santos, the Arsenal	23	55	51	46	16	33
Point Taypu at the entrance of Santos	24	1	11	46	21	43
Laage de Santos	24	18	0	46	9	0
Redonda, or Little Queimada	24	21	26	46	46	0
Queimada Grande	24	28	21	46	38	0
Cananea, Islet Bom Abrigo	25	6	49	47	49	0
Figueira Island, centre (160 feet)	25	21	29	47	59	10
Isle do Mel, Southern summit	25	32	43	48	17	30
Paranagua, Fort on the Bar	25	30	14	48	17	45
Coral Rocks, the largest	25	45	49	48	20	35
Itacolumi Rocks, the largest	25	50	20	48	24	9
Point Joao Diaz	26	6	33	48	31	11
Tamboreti Isles, Southern Isle	26	20	54	48	30	15
Isles Remedios, Southern Isle	26	29	28	48	33	14
Point Itapacoruya, North side	26	47	18	48	35	36
Mount Zimbo, on the continent	27	11	6	48	33	25
Volage Bank, 14 fathoms	26	44	0	48	5	0
ISLE OF ST. CATHERINE AND OPPOSITE COAST.						
Arvoredo Isle, the summit	27	16	47	48	20	0
The Fort Sta. Cruz d'Aneatomirim	27	25	32	48	32	22
San Miguel, the Church (on the continent)	27	27	15	48	33	38
San Antonio, the Church (on the island)	27	30	17	48	26	35
Town of Nossa Senhora do Desterro	27	35	25	48	29	16

NAMES OF PLACES.	LATITUDE.			LONGITUDE.		
San José, the Church (on the continent)	27°	36′	18″ S	48°	33′	26″ W
Le Ribeiraó, the Church (on the island)	27	42	18	48	30	35
The Isle dos Cardos	27	48	38	48	31	53
Isle Aranhas, the largest	27	29	42	48	18	12
Isle Campixe	27	42	12	48	24	54
Moleques do Sul, the largest	27	49	49	48	22	34
Isles Tres Irmaos, or Three Brothers	27	50	10	48	26	9
Point Catheta	27	35	34	48	22	6
—— dos Frailes (Friars' Point)	27	50	0	48	30	36
Isle do Coral	27	55	10	48	29	13
Cape Guaratuba	28	6	12	48	34	52
Cape Uvidor	28	12	24	48	34	52
Islet Tocoromi	28	19	29	48	30	30
Isle Lobos de la Laguna	28	24	36	48	40	4
Morro da Barra	28	29	18	48	44	52
Cape Sta. Marta Pequeno	28	38	32	48	45	40
Barra Velha	28	51	30	49	11	9
As Torres	29	28	0	49	54	54
Praya or Beach of Fernambuco Eastern part	29	52	0	49	54	0
———————— of Destretto, Eastern part	31	12	0	50	35	0
Rio Grande de S. Pedro, the tower	32	7	20	52	4	30
Los Castillos, Eastern Rock	34	24	30	53	36	14
Cape Sta. Maria, or Rocha	34	39	1	54	4	54
Isle of Lobos, centre	35	0	51	54	48	57
Maldonado Tower	34	53	27	54	54	22
Isle Gorretti	34	55	43	54	55	11
Ballena or Whale Point	34	53	44	54	59	17
Isle Flores, Light-tower on S. W. end	34	56	19	55	51	42
Monte Video, Cathedral	34	54	8	56	8	19
Isles Ratos de Monte Video	34	52	3	56	10	4
Hill and Lighthouse of Monte Video	34	53	2	56	11	39
The Panela Reef	34	54	45	56	21	9
Colonia del Sacramento	34	28	14	57	45	46
Cape San Antonio	36	19	36	56	42	24
Rio Salado	35	44	1	57	19	24
Point Piedras	35	27	40	57	4	9
Point del Indio	35	15	20	57	6	51
Magdalena Church	35	2	14	57	28	51
Atalaya Point	34	54	56	57	39	17
Punta de San Jago	34	50	16	57	50	14
———— Lara	34	47	14	57	56	34
Buenos Ayres, Mandeville House	34	36	18	58	19	6

PATAGONIA AND TIERRA DEL FUEGO.

Cape St. Antonio	36	19	30 S	56	42	30 W
Cape Corrientes	38	0	0	57	40	0
Rio Negro, entrance	40	59	0	63	4	0
Port Valdes	42	30	0	63	40	30
Port St. Elena, Observatory	44	29	45	65	29	45
Port St. Antonio	45	2	30	65	49	0

NAMES OF PLACES.	LATITUDE.			LONGITUDE.		
Port Melo	45°	3′	0″ S	66°	2′	0″ W
St. George's Bay, Port Malaspena	45	11	15	66	40	0
———, Port Cordova	45	45	0	67	27	30
Cape Blanco	47	16	0	65	39	30
Port Desire	47	45	0	66	3	30
Port St. Julian	49	8	0	67	43	30
Santa Cruz Harbour	50	17	30	68	31	30
River Gallegos, Cape Fairweather	51	33	0	69	0	0
———, Cape Gracios-a-Dios	51	43	0	69	7	0
Strait of Magellan, Cape Froward	53	53	20	71	11	0
———, Cape Virgins	52	18	0	68	17	40
———, Queen Catharine's Foreland	52	39	0	68	32	30
Cape St. Sebastian	53	27	0	67	59	0
Cape St. Ines	54	8	0	66	57	45
Staten Island, New Year's Harbour	54	48	55	63	59	30
———, Cape St. John	54	42	10	63	40	30
Le Maire's Strait, Bay of Success	54	48	2	65	10	20
———, Cape Success	55	1	30	65	12	30
Evout's Islands	55	33	15	66	40	30
Barnevelt's Islands	55	49	0	66	40	30
CAPE HORN	55	58	40	67	12	25

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